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THE OFFICIAL [illegible] ATION OF THE AMERICAN ASSOCIATION [illegible] COLLEGES OF PHARMACY

"Peace will never come to the world through any plan until peace has come to every man who lives. To every man. Every single man. There cannot be peace without until there is peace within each person."—Curtis Bok.

Volume VII July, 1943 Number 3

...MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

KANSAS

University of Kansas, School of Pharmacy, Lawrence. J. Allen Reese, Dean (1907).

KENTUCKY

Louisville College of Pharmacy, Louisville. Gordon L. Curry, Dean (1900).

LOUISIANA

Loyola University, New Orleans College of Pharmacy, New Orleans. John F. McCluskey, Dean (1921).

Xavier University, College of Pharmacy, New Orleans. Lawrence F. Ferring, Dean (1923).

MARYLAND

University of Maryland, School of Pharmacy, Baltimore. Andrew G. DuMez, Dean (1900).

MASSACHUSETTS

Massachusetts College of Pharmacy, Boston. Howard C. Newton, Dean (1900).

MICHIGAN

Detroit Institute of Technology, College of Pharmacy and Chemistry, Detroit: Eaton P. Stout, Dean (1923).

Ferris Institute, College of Pharmacy, Big Rapids. Howard Hopkins, Dean (1928)

University of Michigan, College of Pharmacy, Ann Arbor. Maward B. Lewis, Director (1900).

Wayne University, College of Pharmacy, Detroit. Roland T. Lakey, Dean (1925)

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University of Minnesota, College of Pharmacy, Minneapolis. Charles H. Rogers, Dean (1901).

MISSISSIPPI

University of Mississippi, School of Pharmacy, Oxford. Elmer L. Hammond, Dean (1918)

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State University of Montana, School of Pharmacy, Missoula. Charles E. F. Mollett, Dean (1917).

NEBRASKA

Creighton University, College of Pharmacy, Omaha. William A. Jarrett, Dean (1918)

University of Nebraska, College of Pharmacy, Lincoln, Rufus A. Lyman, Dean (1918)

...admitted to the Association.

THE AMERICAN JOURNAL
— OF —
PHARMACEUTICAL EDUCATION

Volume VII ***July, 1943*** ***Number 3***

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Editorial Office: College of Pharmacy, University of Nebraska, Lincoln, Nebraska. Address all communications to the Editor.

Two new editions

YOUNGKEN
Textbook of Pharmacognosy
5th Edition

By HEBER W. YOUNGKEN, Phm.M., Ph.D.
Professor of Pharmacognosy and Biology, Massachusetts College of Pharmacy.

CONTENTS

Part I.—Morphologic Considerations of Drugs: Fundamental Considerations; Morphological Classification of Crude Drugs; Therapeutic Classes of Drugs. Part II. Taxonomic Consideration of Drugs: Drugs of Vegetable Origin; Drugs of Animal Origin; Microanalytical Methods.

511 Illustrations; 1038 Pages; $7.50. (1943)

The new edition of this successful text includes a study of newer methods of production, new commercial sources and uses of organic drugs. Cultural methods of drug and condiment plants in demand today, and a new chapter on therapeutic classes of drugs is presented.

SCOVILLE
The Art of Compounding
7th Edition

Revised by JUSTIN L. POWERS, Ph.D., *Director, American Pharmaceutical Association Laboratory, and* GEORGE E. CROSSEN, Ph.D., *Dean and Professor of Pharmacy, Drake University.*

CONTENTS

The Prescription; Nomenclature and Vocabulary; Incompatibility; Therapeutic and Physical Incompatibilities; Chemical Incompatibility; Solutions; Percentage, Saturated, Gaseous and Stock Solutions; Adjusted Solutions; Colloidal Solutions; Liquids Containing Insoluble Substances; Emulsions; Confections, Electuaries, Jellies; Pills; Tablets; Lozenges, Pastils, etc.; Powders, Species, Cachets, Capsules, Wafers; Suppositories, Bougies, Pessaries, Politzer Plugs; Ointments, Cerates, Plasters; Miscellaneous External Preparations; Biological Products; Vitamins; Homeopathic Pharmacy; Sterilization and Disinfection; Key to State Board Prescriptions.

57 Illus.; 457 Pages; $4.75. (1943)

This classic text and reference-book on American pharmacy has been revised and brought up-to-date completely. The book includes a thorough study of drugs and their preparations, including the many new remedies that have come to the forefront in recent years. The articles on vitamins, glandular products, incompatibilities, homeopathic pharmacy, nomenclature, etc., and the illustrative State Board Questions and Answers are just a few of the especially important subjects of interest in this new edition.

THE BLAKISTON COMPANY
PHILADELPHIA, 5, PA.

Program of the American Association of Colleges of Pharmacy

Forty-Fourth Annual Meeting

Columbus, Ohio, September 8-10, 1943

All sessions to be held at Deshler-Wallick Hotel
President, Howard C. Newton; Vice-President, A. B. Lemon; Secretary-Treasurer, Clark T. Eidsmoe; Chairman of the Executive Committee, Charles H. Rogers.

WEDNESDAY, SEPTEMBER 8

2:00 P. M. Meeting of the Executive Committee.

THURSDAY, SEPTEMBER 9

8:00 A. M. to 10:30 A. M. Conference of Teachers.
10:45 A. M. First Session.
1:30 P. M. Second Session.

FRIDAY, SEPTEMBER 10

9:00 A. M. Third Session.

Sessions of the Association

FIRST SESSION, THURSDAY, SEPTEMBER 9, 10:45 A. M.

1. Roll Call.
2. Appointment of Committee on Resolutions.
3. Appointment of Nominating Committee.
4. Appointment of Auditing Committee.
5. Address of the President, Howard C. Newton.
6. Report of the Secretary-Treasurer, Clark T. Eidsmoe.
7. Report of the Executive Committee, Charles H. Rogers.

SECOND SESSION, THURSDAY, SEPTEMBER 9, 1:30 P. M.

1. Reports of Standing Committees:
   (1) Committee on Relation of Boards and Colleges, Henry S. Johnson.
   (2) Committee on Libraries, Charles O. Lee.
   (3) Committee on Activities for Alumni, Thomas D. Rowe.
   (4) Committee on Problems and Plans, Rufus A. Lyman.
   (5) Committee on Educational and Membership Standards, Ralph E. Terry.
   (6) Delegates to the American Council on Education, Rufus A. Lyman.
2. Report of Committee on Teachers' Conferences, John F. McCloskey.
3. Report of the Committee on Distributive Education, Earl R. Serles.
4. Report of the Editor of the American Journal of Pharmaceutical Education, Rufus A. Lyman.
5. Report of Committee on Predictive and Achievement Tests, A. B. Lemon.
6. WLW's Contribution to Pharmaceutical Education, Ralph E. Visconti.

THIRD SESSION, FRIDAY, SEPTEMBER 10, 9:00 A. M.

1. Reports of Special Committees:
   (1) Committee on Professional Relations, George C. Schicks.
   (2) Committee to Revise Constitution and By-Laws, A. G. DuMez.
   (3) War Emergency Advisory Committee, A. G. DuMez.
   (4) Committee on Scholarship, H. Evert Kendig.
2. Report of the Historian, George Urdang.
3. Report of Committee on Resolutions.
4. Report of Auditing Committee.
5. Miscellaneous Business.
6. Election of Officers.
7. New Business.
8. Executive Session.

Conference of Teachers of Pharmacy

Chairman, Earl P. Guth; Vice-Chairman, Louis W. Busse; Secretary, John F. McCloskey.

THURSDAY, SEPTEMBER 9, 8:00 A. M. to 10:30 A. M.

A Symposium on that part of the Pharmaceutical Syllabus dealing with Pharmacy.

Conference of Teachers of Chemistry

Chairman, George W. Hargreaves; Vice-Chairman, Lloyd M. Parks; Secretary, Arthur E. James.

THURSDAY, SEPTEMBER 9, 8:00 A. M. to 10:30 A. M.

A Symposium on that part of the Pharmaceutical Syllabus dealing with Chemistry.

Conference of Teachers of Pharmacognosy and Pharmacology

Chairman, A. John Schwarz; Vice-Chairman, Robert L. McMurray; Secretary, Lloyd W. Hazleton.

THURSDAY, SEPTEMBER 9, 8:00 A. M. to 10:30 A. M.

1. "The Need and Opportunities for Expertly Trained Pharmacognosists," Elmer H. Wirth, Heber W. Youngken, Edward J. Ireland.
2. "The Use of a Mounting Agent in the Presentation of Powdered Drugs," L. G. Gramling.
3. "Some Pharmacological Problems of the National Formulary," Melvin W. Green.
4. "General Discussion of the Pharmaceutical Syllabus as it Applies to Pharmacognosy and Pharmacology." Members are asked to be prepared to participate in a full discussion of this subject.

Conference of Teachers of Pharmaceutical Economics

Chairman, Lawrence F. Ferring; Secretary, Joseph H. Goodness.

THURSDAY, SEPTEMBER 9, 8:00 A. M. to 10:30 A. M.

A Symposium on the Proposed Commercial and Legal Subjects in the Coming Syllabus.

Program of the American Institute of the History of Pharmacy

THIRD ANNUAL MEETING

To be held at Columbus, Ohio, the exact time and place of the meeting will be made known within the program of the meeting of the American Pharmaceutical Association and its affiliated associations.

I. Council Meeting

1. Report of the President.
2. Report of the Secretary. Reading and Discussion of the Articles of Organization of the American Institute of the History of Pharmacy (A. I. H. P.) as an institution incorporated under the law of the State of Wisconsin and of the By-Laws of the A. I. H. P.
3. Report of the Director.
4. Report of the Treasurer.
5. Discussion of Council membership.
6. Miscellaneous.

Since a very important matter has to be made known and discussed, the presence of each member of the Council is necessary and expected.

II. Open Meeting

Following the Council Meeting, an informative meeting is planned open to everyone interested in the ideals which the American Institute of the History of Pharmacy is intended to serve and to some extent to realize.

Program of the Twenty-First Annual Plant Science Seminar

Columbus, Ohio, September 7-8, 1943

The postcard poll of July 8th definitely indicated the desirability of holding a meeting of the Plant Science Seminar this year. Accordingly, Dr. L. David Hiner, Professor of Pharmacognosy in the College of Pharmacy of the Ohio State University has been appointed Local Secretary and has charge of the program and arrangements.

It is at Dr. Hiner's kind invitation that the Seminar will meet at Columbus, Ohio, on Tuesday and Wednesday, September 7th and 8th, 1943. Dr. Hiner has arranged a splendid program, a copy of which is attached. When you read it over, we know that you will want to be with us this year. Forty have already indicated their intention of coming, in the postcard poll.

This is a year of streamlining. The A. Ph. A. has streamlined its convention. Our five-day Seminar has been cut to two, but is crammed full of valuable information, interesting lectures, delightful botanizing and the old spirit of friendliness for which the Seminar is so famous.

The headquarters hotel for the convention is the Deshler-Wallick, and most of you will want to stay there. Transportation from the hotel to the University Campus, where the Seminar meetings will be held, is excellent. The hotel has 1000 rooms, all with baths: single rooms at $3.30, $3.85, $4.40, $4.95 and $5.50 per day; double rooms with double beds, $5.50, $6.05, $6.60, $7.70 and $8.80 and double rooms with twin beds at $5.50, $6.60, $7.70, $8.80 and $9.90. Additional accommodations and rates at the Deshler-Wallick as well as other Columbus hotels are given on page 188 of the June number of the Practical Edition of the Journal of the American Pharmaceutical Association.

WE URGE YOU TO MAKE YOUR RESERVATIONS AT ONCE!

Not only your hotel reservations but also your railroad reservation. Traveling and living facilities everywhere are overtaxed nowadays.

Any further information desired may be obtained by addressing the Local Secretary:

Dr. L. David Hiner
College of Pharmacy,
Ohio State University
Columbus, Ohio.

The officers and members of the Plant Science Seminar cordially invite you to attend the twenty-first annual meeting in Columbus, Ohio, September 7-8, 1943.

Program

All meetings will be held in the Pharmacognosy Laboratory in the Pharmacy Building of Ohio State University unless otherwise announced.

TUESDAY, SEPTEMBER 7

9:00 A. M. Registration. Pharmacy Building O. S. U.

10:00 A. M. Call to order of the Twenty-first Annual Plant Science Seminar. Dr. A. John Schwarz, President.
Address of Welcome. Dr. B. V. Christensen, Dean of the College of Pharmacy, Ohio State University.
Appointment of Committees. Announcements.

11:00 A. M. Illustrated Lecture, "Kodachromes of a Medicinal Plant Survey of Ohio." Mr. Arthur E. Schwarting.

Luncheon

2:00 P. M. Lecture and conducted tour: "A Cooperative Purnell Medicinal Plant Cultivation Project," Dr. Alex Laurie and Mr. Willis R. Brewer.

4:00 P. M. A kodachrome illustrated movie lecture, "Forest Rose Legend of Christmas Rocks," Mr. W. R. Byrum. (This locality will be visited on the field trip.)

Dinner.

8:00 P. M. Lecture: "The Lure of the Sandstone Country," by Dr. Edward S. Thomas. (This illustrated lecture also covers the region visited on the field trip.)

WEDNESDAY, SEPTEMBER 8

8:00 A. M. A field trip to Mt. Pleasant, Christmas Rocks and the Neotoma Valley, conducted by Mr. Wolfe of the Department of Botany and Mr. Clyde Jones, curator of the Botany Herbarium of Ohio State University. (In the event of inclement weather or of unforeseen future curtailment of gasoline, the field trip may be replaced by a day's program in the Natural History Museum.)

Dinner.

8:00 P. M. Final Business Session. Report of Committees. Election of Officers for the 22nd Annual Plant Science Seminar. Adjournment.

Any changes in this program will be posted on the bulletin board in the College of Pharmacy and at the Deshler-Wallick Hotel.

WARNING FROM WASHINGTON

Discussing governmental rationing of magazine paper, David Lawrence, Washington correspondent famous for his forecast of coming events, says in his column in the New York Sun: "Where readers of newspapers and magazines are in for surprises is in the prospect that, once a subscription is discontinued, many publishers will not find it possible for some time thereafter to reinstate it. Many publications today already have waiting lists of and checks from would-be subscribers, hoping to take advantage of somebody's discontinuance. People who are careless about renewing subscriptions may find real inconvenience thereby."

Do not let your subscription expire.

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The American Journal of Pharmaceutical Education

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The President's Page

Establishing the proper status of the students and the college of pharmacy in the Government's wartime program of education and training is still the major problem of the whole pharmaceutical profession and a critical problem of our Association. It is in recognition of this and in accord with the suggestion of the Editor, that I shall outline briefly what has been done toward solving this problem since I last reported to you, in the April issue of this Journal.

In that issue I brought the account of the activities of our Association in its work on this problem up to April 1. I stated that many things of significance may have happened by the time it was printed. And that statement was prophetic.

On April 2, our committee met with a group representing the National Roster of Scientific and Specialized Personnel and the Selective Service System which included Mr. Wermiel, Mr. Sherman, Dr. Frederick J. Kelly and Colonel Griffith. The situation was discussed at length and it was finally decided that a recommendation should be made to the proper subcommittee of the War Manpower Commission that all students now in the colleges of pharmacy be subject to consideration for deferment just as are the students in the other health professions. Mr. Wermiel said he would prepare the recommendation and submit it to the subcommittee for action. A meeting of this subcommittee was set for April 7. It seemed to be agreed that "freezing in" all present students was the most that could be accomplished, as in no other field had consideration for deferment gone below the present freshman class.

On April 7, our committee, with Dr. Edward C. Elliott, met at the time and place agreed upon April 2 . Colonel Griffith and two captains appeared promptly but Mr. Wermiel did not appear with the recommendation which he was to prepare and submit. After some discussion the meeting was closed without action. The chairman, Mr. Lerner, who had arrived very late, said action would be taken soon but we felt that this was a most unsatisfactory meeting.

During the next three weeks many informal conferences with interested officials were held by members of our committee. Several of these finally led to a meeting in Chicago

on April 27, which included Dean Rogers, E. F. Kelly, Dean Serles, and P. H. Costello. A brief was prepared with the advice of Dr. Fishbein of the American Medical Association and Dean Allen of the University of Illinois, "in support of the continued classification of pharmacy as an essential activity under health and welfare services, the continued deferment of pharmacists, and a provision for the training of an adequate number of pharmacists." This brief was transmitted to the War Manpower Commission with the "blessings" of the medical conferees. No action on it was reported officially to the committee by the Commission.

The next official move was indicated in a telegram sent to each of the colleges of pharmacy by R. P. Fischelis, Chief, Medical and Health Supplies Section, Office of Civilian Requirements, War Production Board, requesting statistical data on present enrollments and the status of acceleration of the curriculum. Dr. Fischelis had been requested by the War Manpower Commission to make a study of the situation in pharmacy on which it would base its decision regarding pharmacists and pharmacy students. This study was made with the cooperation of the Division of Public Health Methods, National Institute of Health and the Hospital Division, U. S. Public Health Service. It was prepared promptly and is comprehensive.

On June 30, our committee (Kelly, DuMez, Rogers, Fischelis, Bohrer, Muldoon, and Newton) met in Washington and after hours of discussion and planning received the official amendment to Activities and Occupations Bulletin, 33-6, part D, on July 1. This amendment was in line with expectations and constituted one more step in the direction of our objective. The amendment clarified the status of present sophomore, junior and senior students, who could complete the curriculum within the next twenty-four months. It left the way open for an entering class provided it could complete the curriculum in twenty-four months from the date of certification. If the entering students were seventeen and one-half years old or less, the amendment would be effective for a thirty-month curriculum. But for those of eighteen years or older, it seems to indicate a definite pressure exerted toward a twenty-four month curriculum. The possible effects of this amendment are numerous and important.

As we write this another factor becomes effective and may have some influence on pharmaceutical education. I refer to the establishment of the Pharmacy Corps in the U. S. Army. It is too soon to estimate what its influence, if any, may be.

This brief resume will prove helpful, we hope, in bringing to the members of our Association some additional information on which they may base some of their discussions at the coming meeting. This meeting at Columbus is truly one of great import and we trust all of our members, realizing this, will be actively represented on this occasion.

Howard C. Newton

A Commencement Address*

CURTIS BOK

President Judge, Court of Common Pleas No. 6, Philadelphia

Something gets into college presidents about this time of year that makes them go forth into the great world and return with slightly bewildered persons like me under instructions to say anything they want. It is the most difficult assignment to fill with good taste and mercy to one's audience. I still remember the amiable old fossil who took his instructions literally and laid bare the secrets of the universe to my perspiring classmates and me for a snappy hour and forty-five minutes. I know how it is. Thanks to the brevity which modern science has bred in us the world can now be adequately if somewhat generally explained in twenty minutes flat.

Modern science, incidentally, has a good deal to answer for. Recently I saw it stated that if all the two billion people in the world were stood up touching back to front and shoulder to shoulder, they would cover an area approximately twenty miles square. I then figured out that if all these people were evenly distributed over the earth's surface, each person would find himself on an island twenty-one acres large and surrounded by forty-two acres of water. This seems like enough

*An address delivered by Mr. Bok at the seventy-second annual commencement exercises of the University of Nebraska. The thought expressed by the eminent jurist was so inspiring and satisfying that it seemed like a benediction in a war torn world. In order that our readers might share that experience, a request was made to permit publication in the Journal. That request was freely granted.—Editor.

room for anyone, but it becomes a bit complicated when we also distribute the other things that the world contains beside people and give each twenty-one acre island its share of that. There will be quite a lot of ice in the water and an acre or two of ice on the island; a small mountain, partly forest-clad and partly rocky: a patch of desert and some forest and jungle: a fair-sized stream of water, a small lake and a swamp. Part of each island will be prairie, on which a bit of grain and vegetables grow, and over which a few cattle graze. The single inhabitant will have a small house, a factory and a store, a paved and dirt road, a section of railway and a bridge. There will be a series of small mines, and some oil will be in evidence. There will be a sewer, a rubbish heap, a graveyard, and a place for entertainment. He will have a small ship tied up to a tiny dock. It will be very cold in one part of the island, very hot in another, and pleasant in the rest. The lone inhabitant will have in his house a one two-billionth part of all the gadgets man has invented and manufactured on the theory that he needs them for his comfort and well-being. He will have to spend part of his time in raising food and part in making all these contrivances and thinking up new ones. He will have a little money, but very little.

Let us set all these people down on their islands and wait to see what happens. It very soon appears that everybody finds out he cannot do all these different kinds of work and needs help. Then he finds that he has a lot of stuff he does not want and other stuff that he wants more of. Almost at once he is in a mess trying to straighten that out. The twenty-one acres can support him but he cannot work out evenly all the things he has got to do. He cannot always get other people to help him do the things he wants to do or the way he wants them done. He has too little money to buy what he thinks he needs, and he tries to exchange things by setting up arbitrary values for them in books of credit, but this gets out of whack when for some reason that he cannot see supply outruns demand or vice versa. It is not long before he is thoroughly mixed up, and not understanding why it is, he becomes afraid. Then he starts tearing things apart and trying new systems.

We are now in the midst of one of those violent periods of our civilization. There have been many of them and there will be more. How many more is a question, but there are

signs to indicate that men will be able to make war so terrible that they will refuse out of fear to resort to it. Excepting the indiscriminate bombing of cities and the treatment of conquered peoples, this war is being waged with weapons that are within the general limits of sportsmanship. I am speaking only of the weapons. As though by common consent, neither side has as yet resorted to gas or bacteria. No doubt each side is prepared to do so if the other starts it first. With the advance of scientific knowledge, I have little doubt that what is being held back is so deadly and devastating that it is being held back for that reason. As science advances farther, such weapons will be made even deadlier and others added to them. We know already something about how to smash the atom. We know so much about electricity that the invention of rays capable of electrocuting people and disintegrating property from a distance will become a fact in our hands and not merely in the comic strips.

When one group is able to destroy another by suffocating its cities with gas, by creating an endemic plague, by pulverizing its material through atomic destruction, and by destroying its people and their property through electric power, so that no man, woman or child is safe no matter where they are, there is a chance that men will refrain from fighting altogether. But mankind is not yet at that point. Race suicide does not yet stare us starkly in the face. I believe that so long as war is limited to explosives men will continue to resort to it, for explosives cannot kill enough people to rob war of its glories for those who survive. Pugnacity is as deep a hunger as the hunger for food or the hunger for sex, and so long as war kills only a minority, that minority will be offered up as a sacrifice. In short, when allowance has been made for the stated ideals of the present conflict, we must admit that what men are really fighting for is the right to fight again.

Let us think of this was as a was of explosives. The war of gas and germ and cyclotron and ray is still ahead of us. Or at least the threat of it is. And I fear that someone will arise ruthless enough to make the threat, for it will be a new kind of war—swift and terrible and silent—and it will catch some groups unaware, the old-fashioned groups who will think only in terms of noise and be unprepared for the invisible, silent murder of a nation.

It is depressing to think that mankind may stop fighting only through fear. Fear alone is not enough. It is a mistake to think of the world as alternately at war and at peace. It is more honest to admit that the world is always at war, but in different ways. When we are not fighting with bullets we fight with economics. We simply lay aside one form of warfare when we have had enough of it and take up the other. It is hard to say which one causes the more casualties and suffering. Armed warfare kills and maims and grows vengeance, but so does economic warfare: it has its Okies and its sharecroppers and its slum dwellers, and they die of want and disease, and are maimed, and grow to hate. We cannot expect to stop one form of warfare, even through fear, unless we also stop the other. Economic warfare comes first. Greed or economic development by one nation at the expense of others is bound to give offense, and if the offense is great enough, the victim of it will turn to armed warfare in desperation, however terrible it may be.

Running through the centuries, it seems clear that men have done their best when they were free. But what does free mean? Certainly not the right to do as one pleases. We think that America is the freest country in the world, but we have more laws per square foot than the rest of the world put together, and every law tells us what we may not do or what we must do. We are free only because we steadily assert that our neighbor has equal rights and is or can be as good as we are. The only thing that will keep us free is an intelligent discipline imposed and accepted in the common interest, with as much of it voluntary as the peace and dignity of the Commonwealth permits. We take a chance in making pure grants of freedom, for the very things we grant are the things which can destroy us—the freedom to speak any words, to worship any God, to assemble for any reason. We take a chance because the outer world is so positive and the inner world so negative: it is so easy to give offense to one another. Yet we take that chance, with the instinct that man has dignity and that his heart is steadier than his mind.

But all of this is not enough to bring peace. I have no ready plan to give you. This is the open season for peace plans. You may pay your money and take your choice. The world will have to try its plans, its leagues, its international laws and police forces: some good comes from them here

and there and now and then. After a phase of violent warfare there is a narrow band of time in which men raise their heads and look to the hills for help before lowering themselves again into the arena and turning to a war of trade and credit: in this short time they do a little good, let loose a larger idea into the world to grow as it can, and then turn their backs upon it. This is not much, but it is something. Since this war is wider, deeper and more terrible than the last one, the idea to be set up in the effort to prevent its happening again will be wider and deeper and better than the last one. If it includes an international police, that police must have a body of regulations to execute and defend. These laws can be made only by a body created by a group of interested nations to which those nations must turn over a part of their sovereignty. Some such structure will most likely be provided for on paper, either globally or regionally. The mere provision will do good: the idea will be stated and so set free. But in practice it will fail to produce an enduring peace unless the nations will be willing to give up enough sovereignty to make it effective. I am not very hopeful that they will, except on paper and, to quote, "in principle." As the nations recede from the idea of a global or regional United States into a welter of conflicting sovereignties, they will be planting the dragon teeth of another war.

It is bound to happen that way, no matter what form the plan takes, unless the spirit behind it can keep pace with the ideal. I doubt if it can as yet, and therefore I say there will be other wars.

This is due to one very simple thing, and because I am a Quaker I venture to say it to you. Peace will never come to the world through any plan until peace has come to every man who lives. To every man. Every single man. There cannot be peace without until there is peace within each person. There cannot be an end to war until men are no longer at war within themselves. Until they have become peaceful within, they can plan for centuries and yet not know how to make their plans work. They have achieved the power to formulate ideals, but not as yet the full inner power to practice them.

I believe that war can result in a spiritual revival. If it did not, we would all descend to eating flesh and drinking blood. In such an idea is the truth of Justice Holmes' remark

that in a philosophic view of the world, war cannot be considered absurd. I give you no other plan for peace because I know that no plan will work unless there is peace within the individual soul. That is the deeper ground. It is the atmosphere I recommend to you to live in. If you can do so you will know that peace can be won and held by an idea: you will be able to achieve an even working of the soil and an even distribution of its fruits; you will know that one man can look into another man's face and never even think of its shape or color; you will learn that tolerance is not merely letting happen what happens but is an effort to make decency prevail; and you will acquire a voluntary discipline of spirit and an attitude of courtesy towards the universe.

I wish I could tell you more about how to work this out. It is the fault of much religious teaching that it is long on ideals and short on practical instruction. Most of you are from the Middle West, with whose problems I am unfamiliar. The town of Falls City, in this State, where my wife comes from, still gets amusement out of me because when I first visited there and heard the men talking about the price per hundred for hogs I wanted to know whether they were talking about so much per hundred pounds or per hundred hogs. But I know that in the past twenty-five years we have built six million miles of paved roads in this country with efficient gutters that drain off the rainwater and dump it into the rivers. One result is that during this time the subterranean water table of the Mississippi Valley has fallen from eight to thirty feet. I know that since the last war and until the present administration got busy and did something about it the land area which had been totally or partially destroyed by wind and water erosion was four times the size of Texas, and that if it had continued at the same rate for another fifty years the remaining arable land in the United States would be only twice the size of Nebraska.

To make a desert of this country would so disrupt world economy as to ruin any peace plan. To make any plan work, people must learn to lay hands upon the earth and its resources with intelligence: that is one thing I meant when I spoke of an attitude of courtesy towards the universe.

It is hard to be specific in the twenty minutes I spoke about. What little I know has to do with balance and I know that some balance is possible. It is significant that although

men have been unceasingly at war in one form or another, they have built churches and cathedrals and worshipped there the one person in history who led all the way a life of complete and simple love. Man does try a little despairingly to balance his hunger against the Divine Dark. I know a lawyer's work deals with private warfare and that the method of the law, however much it creaks and compromises, does achieve civil peace between man and his neighbor. I know that the medical profession works with increasing success to preserve the delicate balance between health and illness. But in the field of economics, man has not been able to take the elements of earth and water, wind and light and fire, and make them work harmoniously to his purposes.

This is your job, in the interest of peace. It can best be done by making your inner life less negative and your outer life less positive. Nature, if you look at it long enough, will show you that she works by uncompromising inner laws, but the external manifestation of those laws is casual. Her inward precision gives us a balanced planet on which to live, where flowers grow and streams wander and beautiful level sunsets come upon the prairie. Similar precision in us could bring similar graciousness of living, and I believe that we are given the power to achieve such accuracy, each person within himself. It is one of the central mysteries of the universe that absolute laws give freedom for relative growth and expression. Man runs amok when he tries to reverse Nature's pattern. First things come first. If gravity were relative instead of absolute, we would not be alive another five minutes. So long as gentleness remains relative and not absolute there will be wars and desolation. I see no short or easy road to absolute gentleness. Man must live out his hungers and come through them to simplicity on the other side. But while he does so as a race, single persons can become gentle until there are enough of them to count and later on to govern. There is no other way. Hunger is so deep that I do not like to think in terms of right and wrong: there is only the distance one can see by his own light, and if he looks his hardest and is not careless, that light will serve him.

I hope this does not sound too much like a sermon. Maybe you think that all I have told you is to become gentle people. Do not forget that I have not told you to retire from the world. Please stay in it and work in it, and also become gentle. You

have had one of America's finest examples of that in your own State. By his own character former Senator Norris has stood for honesty in government: by his idea of the unicameral legislature he has stood for simplicity in government: in the last war he stood against violence: and he won a long fight for government-owned power, in this State and in the Nation. That is what I mean by laying hands intelligently upon the earth and its resources: Mr. Norris is an example of a person with an attitude of courtesy towards the universe.

You need not be Senators in order to be effective. It will do if you can put your conception of the infinite into your work, whatever it may be. Only be sure you have a conception of the infinite, so that what you do will be not merely a job but a way of life as well. Let it be your own, and walk by your own light. I never saw a fully integrated person who was not also gentle. If we can achieve this, each of us, all that is poignant and sensitive in man can live in peace.

Some Contributions of Pharmacists to Science*

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According to W. W. Charters in the introductory statement of "Basic Material for a Pharmaceutical Curriculum," a report of a survey of pharmacy from the functional point of view: "Pharmacy is an ancient and honorable profession. Its beginnings are lost in the mists of antiquity and its history is replete with substantial accomplishments. Pharmacy is the mother of medicine and the original source of many forms of research. Numerous investigators who have made epochal contributions to science and art have been enrolled among its followers. Today pharmaceutical research is scholarly and productive."

*Presidential address delivered before the Nebraska Chapter of the Society of Sigma Xi May 12, 1943. The author wishes to acknowledge his liberal use of "History of Pharmacy," by Edward Kremers and George Urdang, J. B. Lippincott Co., Philadelphia, 1940, as a source for much of the material contained in this paper. This subject was chosen rather than some technical research in the pharmaceutical field because it was thought to be of greater general interest to a group of workers in diversified fields and since pharmacy constitutes but a small minority of the vast army of research workers, it naturally follows that their activities are less well known than those of the other larger groups.

Despite the obscurity of its origin, it is known that European pharmacy, and later American pharmacy, rose with the development of Western culture, being influenced by the ancient civilizations of Babylon and Assyria, Egypt, Greece, and Rome. Noteworthy contributions were also made by the Arabs of the Middle Ages.

In considering the use of remedies for the treatment of disease, it seems natural to ask how man came to adopt this practice in the beginning. Although many explanations have been offered, most historians of medicine and pharmacy agree in the statement "that neither empiricism nor magic stand at the beginning of the internal employment of medicines by man but the animal function, the instinct."

This should not be interpreted as meaning that empiricism and magic have not both played important roles in the selection and use of remedial agents. For a long period, magic dominated the medical practice of the ancient Babylonians and Assyrians, as it does even to this day among primitive peoples. Magic and superstition were also of great importance in ancient Egyptian medicine and these influences are also noted in Greek medicine, in the medicine of the Middle Ages, and even in that of modern times. With the application of inductive and deductive reasoning, it folllows that empiricism became the foundation of the so-called "science" of early medicine and pharmacy.

It should be remembered that the practice of medicine during antiquity in Babylon and Assyria, in Egypt, and for a long time in Greece, was one of the duties of a distinct class of priests, especially educated in the art. Illness was regarded as a form of divine punishment and healing a process of purification. Medicine held a fixed place in the religious ideology, and the change from pollution by sin to purification through penance was called *"catharsis."* This is of specific pharmaceutical interest, since it explains the real meaning of the Greek word *"pharmakon"* and its Egyptian counterpart, *"phar-maki,"* from which the term pharmacy and its many derivatives originate.

Our knowledge of ancient Egyptian medicine and pharmacy is dependent upon the writings of the old historians, especially of the Egyptian, Monethos, the Greek, Herodotus, and the Roman, Pliny, the inscriptions on old Egyptian build-

ings and monuments, and the discovery and deciphering of ancient medical treatises enscribed upon papyrus. In 1930 James Henry Breasted, the noted historian who, incidentally, started his career as an American pharmacist, published and commented upon the so-called "Edwin Smith Papyrus." This work has since been the subject of much controversy among historians, inspired largely by the attempt to evaluate its significance and scientific accuracy as a representation of Egyptian medicine by comparing it with other previously discovered papyri.

Considered from the pharmaceutical point of view, the Papyrus Ebers is of the greatest importance. It bears the name of the German Egyptologist, George Ebers, who purchased the document in 1872, at Luxor and brought it to the attention of the scientific world. It is believed to have been written about 1500 B. C., although a study of its contents seems to indicate that portions of the text are of far greater age than that indicated by this date. The document, which is in the form of a scroll about twenty-two yards in length and approximately 12 inches wide, contains no less than 811 prescriptions and mentions more than 700 drugs from the mineral, vegetable, and animal kingdoms. In an article announcing its translation into English, von Klein states that: "a large portion of the diseases known to modern medical science are carefully classified and their symptoms minutely described . . . seventy-four prescriptions pertain to hair washes, dyes, oils, and depilatories."

The same author writes concerning the forms of administration of remedies according to the Papyrus Ebers as follows: "Medicines are directed to be administered internally in the form of decoctions, infusions, injections (meaning clysters), pills, tablets, troches, capsules, powders, potions, and inhalations; and externally as lotions, ointments, plasters, etc. They are to be eaten, drunk, masticated, or to be swallowed, to be taken often only once, often for many days, and the time is occasionally designated: to be taken mornings, evenings, or at bedtime. Formulas to disguise bad tasting medicaments are also given."

The early history of pharmacy is inextricably interwoven with that of medicine, alchemy, and chemistry. Time does not permit further consideration of the early development of pharmacy, although it is a fascinating subject. We must

rather pass on to the consideration of our principal theme which is to be a brief citation of some of the outstanding contributions of pharmacists to science.

Those of you who have chanced to pass by Pharmacy Hall may not have realized that this building is now the oldest building on the campus which has remained intact in all the glory of its original architectural beauty. Perhaps fewer of you have noted the medallions which adorn the wall at either side of the entrance at the south end of the building. The figure to the right bears the inscription "Wilhelm Scheele, 1742-1786" and the one on the left is labeled "Leopolt Gmelin, 1788-1853." At the time when these were attached to the walls, this building housed the department of chemistry and the names of these men were selected as outstanding contributors to the science of chemistry. When later the department of chemistry moved to newer and larger quarters, and the building became Pharmacy Hall, these medallions were permitted to remain in place, where today they exemplify with almost an equal degree of fitness, the profession of pharmacy. This coincidence becomes less astonishing, however, if the scope of the natural sciences included in the modern pharmaceutical curriculum is considered. This includes in addition to pharmacy itself, chemistry, physics, physiology, botany, bacteriology, pharmacognosy, and pharmacology.

The contributions of pharmaciscts are therefore likely to fall within any of these branches of science with the result that historians tend to classify the contributor according to the field in which his discovery is reported. Thus, although Carl Wilhelm Scheele is universally acclaimed as one of the world's greatest chemists, he was actually a Swedish apothecary who earned his living as such, and made all of his discoveries in the laboratories of the pharmacies in which he was employed. During the last eleven years of his life he served first as manager, and later as the owner and proprietor of the apothecary shop in the small town of Köping, Sweden.

The Gmelin family, of Tübingen, Wirttemberg, is one which is noted for the number of its descendants who distinguished themselves as pharmacists, chemists, botanists, naturalists, etc. The founder of the family, Johann Georg Gmelin, grandfather of Leopolt Gmelin, was the proprietor of the apothecary shop which was maintained during portions of three

centuries by representatives of four generations. The particular member of this family honored by the medallion on Pharmacy Hall, Leopolt Georg Gmelin, it must be admitted, comes from the wrong branch of the family to be considered as a pharmacist. Two of his cousins, representing different branches of the family, and contemporary with him, were pharmacists. Leopolt Gmelin was an outstanding chemist, who is especially noted for his *"Handbuch der Theoretischen Chemie,"* a master work which is highly regarded even today. This was translated into English by H. Watts, and published as a set of 18 volumes.

Pharmacy as a profession has produced many representatives who have applied the results of their research in the several natural sciences upon which pharmacy depends to their calling, both as teachers and as authors of textbooks. In many instances, their findings have represented valuable contributions not only to their own professional field, but to science in general.

That period in chemical history known as the qualitative period is usually divided into two subdivisions: the iatrochemical period, during which the study of chemistry was devoted almost exclusively to the search for useful medicinal substances, and the phlogistic period, based upon the unsound hypothesis of the existence of phlogiston. The latter period ended with the discovery of oxygen and the interpretation of its role in chemical reactions. The majority of the workers in the period of iatrochemistry were physicians, while the representatives of the phlogistic period consisted principally of apothecaries.

The classical experiments of Lavoisier which resulted in the correct interpretation of the nature of oxygen and the overthrow of the phlogiston theory were made possible by phlogistonists, two of whom are apothecaries. In 1774 the French apothecary, Bayen, reported to the Paris Academy of Science upon "une fluide elastique" which escaped when mercuric oxide was heated. The credit for the independent discovery of oxygen is usually given to the English clergyman, Joseph Priestley, who called it "life air" and to Scheele, who called it "empyreal air" or "fire air." Thus two apothecaries helped to overthrow the phlogiston theory, to which they both subscribed, and to pave the way for the rapid progress of chemistry in the 19th century.

In 1661 Robert Boyle defined an element as a substance which could not be resolved into simpler substances. About fifty years later, the French apothecary, Etienne Francois Geoffroy, published a table in the Memoirs of the Paris Academy of Science which represented the first attempt to explain the specific relationships existing between different elements, and laying down the principles of chemical affinity. Twenty-five years later, another French apothecary, Guillaume Francois Rouelle, published a paper which solved the problem of the nature of salts, which had baffled the best chemical minds of that day. He defined a salt as the product of the union of an acid and a base. Soon thereafter, Lavoisier defined an acid as the product of the union of a non-metal with oxygen and a base as the combination of a metal with oxygen. Thus was laid the foundation for the chemistry of acids, bases, and salts which characterized the early portion of the quantitative period in the history of chemistry.

In a similar way, the grouping of analogous elements as triads, in which the atomic weight of the middle member was the arithmetic mean of the two extremes, by Johann Wolfgang Döbereiner, a German apothecary, led to the speculations which became the forerunner of the periodic table of the elements, a classification which has been fundamental to all systematic and theoretical chemistry.

Even prior to Döbereiner's theory of triads, however, another pharmacist, Joseph Louis Proust, had pointed out that the elements in combining with one another did so in definite proportions which were constant. Dalton's law of simple, constant, and multiple proportions was the outgrowth of the experimental data of Proust.

Almost of equal importance were the discoveries of chlorine by Scheele in 1774, of iodine by Courtois in 1812, and of bromine by Balard in 1826. All three discoverers were pharmacists. All three elements were of great importance individually, and their discovery led to a revision of Lavoisier's oxygen theory of acids and pointed the way to newer concepts of acids, bases, and salts.

The contributions of Scheele were so numerous and his discoveries were so far-reaching in their influences upon the development of chemistry, that we are perhaps justified in digressing to sketch in brief his achievements. He was born

in 1742 in Stralsund, Pomerania, and died in his apothecary shop at Köping, Sweden, in 1786. At the age of fourteen he was apprenticed to an apothecary named Bauch in Gothenberg, in which position he remained for eight years. In 1765 he went to Malmö, where he entered the service of a pharmacist named Kjellström; from here he went to Stockholm where he was employed by a prominent apothecary of that city named Scherenberg. It was here in 1769 that his first important work was done. This consisted of the discovery of tartaric acid and the isolation of phosphoric acid from bone ash. In Upsula, the noted teacher of chemistry, Torald Bergmann, who is reputed to be the first to write chemical equations by a crude system of chemical shorthand of his invention, heard of Scheele's work and persuaded him to come to Upsula, where for two years Scheele worked under Bergmann's supervision. Scheele then went to Köping where he ultimately became the owner of an existing pharmacy which was in dire financial straits. He temporarily suspended his experimentation to put the establishment upon a sound financial basis and then returned to his scientific studies.

According to tradition, Scheele's death is presumed to have been caused by the accidental inhalation of hydrocyanic acid while working with it in his laboratory. His untimely end, which occurred in his 44th year, at a time when he was producing many important discoveries in rapid succession, was a great loss to the scientific world. Within the space of seventeen years he is credited with the discovery and identification of over 25 compounds or elements. Many of these were of major importance and usefulness in the fields of pharmacy, medicine, industry, and in the development of theoretical chemistry. Among his discoveries were the following:

Tartaric acid; phosphoric acid from bone ash; hydrofluoric acid; oxygen; potassium permanganate; manganese dioxide; barium dioxide; chlorine; arsenic acid; the arsenical pigment known as Scheele's green; molybdic acid; benzoic acid; oxalic acid; uric acid; hydrogen sulfide; lactic acid; citric acid; malic acid; gallic acid; pyrogallol; glycerin; mucic acid; ethyl acetate; ethyl benzoate; amyl alcohol; and hydrocyanic acid.

It is well known that the metallic elements potassium, sodium, magnesium, calcium, strontium, and barium were first isolated by Sir Humphrey Davy, the father of electrochemistry. However, much of the pioneer work which led to these

discoveries was contributed by pharmacists. The derivatives of sodium, potassium, magnesium, calcium, and barium had been studied by Marggraf, those of barium by Scheele, and those of strontium by Klaproth. The latter has been acclaimed for his extraordinary skill in qualitative and quantitative analysis. Although he did not discover any of the elements credited to Davy, he has been credited with the discovery of uranium (1786), zirconium (1789), and cerium (1803). In addition he is credited with having verified the elemental character of tellurium, strontium, titanium, chromium, and yttrium. Cerium had been discovered independently and simultaneously by Berzelius and by Hisinger, and Klaproth's announcement of the discovery of chromium followed by several months the announcement of this accomplishment by Vauquelin, who was also a pharmacist.

Carbon had been known, both in the form of charcoal, and as the diamond since antiquity, but its elemental character was not recognized at this time. However, many of the important properties of amorphous carbon were reported by pharmacists. Hagan, in 1793, explained the adsorptive property of charcoal as a physical property. Lowitz experimented exclusively with wood charcoal, while Figuier reported in 1810 that animal charcoal possessed superior adsorptive powers. Finally, the French pharmacist, Tuéry, demonstrated in a most convincing manner the remarkable powers of charcoal as an antidote before the skeptical members of the French Academy of Medicine by swallowing a gram of strychnine after having previously taken fifteen grams of charcoal, and surviving the ordeal.

In 1844 the apothecary, Heinrich Rose, announced the discovery of a new element which he named niobium. This discovery has, however, been contested by those who claim that he had rediscovered columbium, which had previously been reported by the English chemist Hatchett. However, the prevailing opinion now is that Hatchett did not discover niobium, but tantalum, which is closely related to niobium, and commonly associated with it. In this country the element which Rose is presumed to have discovered is called columbium, although the name niobium is retained in most other countries.

Andreas Sigismund Marggraf (1709-1782), who has been previously mentioned in connection with his studies of the compounds of alkali and alkaline earth metals, was a phar-

macist who made many outstanding contributions. He worked out a practical and inexpensive method for the preparation of phosphorus and phosphoric acid which served as the basis for important industries. His discovery of sucrose in the sugar beet led to the establishment of the sugar beet industry in Europe.

One of the most significant discoveries in its influence upon medicine and pharmacy was that of Friedrich Wilhelm Sertürner, who at the age of 22 published his first paper in 1805 upon the *"principium somniferum"* which he had isolated from opium. Just one year before, Charles Louis Derosne, the French pharmacist, had reported upon "a substance of particular properties" which he had obtained from opium, without recognizing the significance of his discovery. Oddly enough, Sertürner's initial report attracted no attention. It was not until his comprehensive publication *"Uber das Morphinum, eine neue salzfähige Grundlage"* (Morphine, a new salt-forming base) appeared in Gilbert's *"Annalen der Physick"* that the real significance of his work was appreciated. The new substance was the first alkaloid, so-called because of its alkali-like behavior in combining with acids to form salts. In isolating this substance, Sertürner developed a new technique, which other workers soon applied to other vegetable drugs, with the result that many additional alkaloids were isolated within a brief period. It seemed to follow logically that the majority of these discoveries were made by pharmacists who were naturally more familiar with the drugs which served as sources of these important substances. A partial list of these discoveries, all of which were reported by pharmacists, follows:

Strychnine, brucine, and colchicine (in 1819) and quinine and cinchonine (in 1820) by Pelletier and Caventou.

Narceine and thebaine (in 1832) by Pelletier and Dumas.

Caffeine from the coffee bean (in 1821) by Runge.

Narcotine (in 1817) and Codeine (in 1832), both from opium, by Robiquet.

Atropine (in 1819) by Brandes.

Coniine (in 1831) by Geiger.

Papaverine from opium (in 1855) by Merck.

In recognition of their discovery of quinine from cinchona,

Pelletier and Caventou were awarded a prize of 10,000 francs by the Paris Institute of Science.

The impression should not be given, however, that pharmacists interested themselves exclusively in the study of the alkaloids. While these investigations were going on, remarkable progress was made in other fields of phytochemistry. For example, Kabler reported the discovery of santonin in 1817. Pharmacists also contributed their efforts in unraveling the constituents of digitalis and ergot. When Sir William Tilden introduced nitrosyl chloride as a reagent for the terpenes, a new field was opened up in the chemistry of the volatile oils. In the United States, it was Frederick B. Power who added to our knowledge of volatile oils, and of other plant constituents. He began his investigations in Flückiger's Pharmaceutical Institute at Strassbourg, and continued at the Philadelphia College of Pharmacy, and the University of Wisconsin. Later, as Scientific Director of the laboratory of Fritzsche Bros., and finally as Director of Research of the Wellcome Research Laboratry, in London, he and his collaborators published a remarkable series of papers upon phytochemical subjects. Especially outstanding were his studies on chaulmoogric and hydnocarpic acids which not only represented a valuable contribution in the fight against leprosy, but brought about a revision of the definition of fatty acids.

Pharmacists have also made significant contributions to the fields of physiological chemistry, botany, pharmacognosy, and to industry in general, but time does not permit a recital of examples of all of these. The isolation of sucrose from the sugar beet by Marggraf, as previously mentioned, led to the development of the beet sugar industry in Europe. Of even greater significance was the discovery of the process of catalysis by the apothecary Döbereiner, which plays so important a role in modern industrial chemistry. In 1834 Runge announced the discovery of aniline and phenol from coal tar, thus laying the foundation not only for the synthetic dyestuff industry, but for the synthesis of scores of coal tar derivatives of great medicinal value.

A turning point in the development of organic chemistry was the so-called synthesis of urea, or more accurately, the molecular rearrangement of ammonium cyanate to form urea, reported by Wöhler in 1828. According to LaWall, however,

an English apothecary, Henry Hennel, is said to have anticipated Wöhler by synthesizing ethyl alcohol in 1826.

The first friction match was made by a pharmacist, John Walker, the match head being made of potassium chlorate and antimony sulfide. Many pharmacists have devoted themselves to the study of botany. As representatives of these, Oskar Brefeld (1839-1925) and Ferdinand v. Müller (1825-1896) may be mentioned. Brefeld made a careful study of the biology of the fungi. v. Müller, a native of Germany, emigrated to Australia, where he became that country's greatest botanist, publishing the results of his study of the flora of Australia in 40 volumes.

One pharmacist is even credited with having been a pioneer in aeronautics by some historians. Although the invention of the balloon is credited to the Montgolfier brothers, and they are usually given credit for the first balloon ascension by man, one author, H. Heimen, asserts that the French apothecary, Pilâtre De Rozier, was the first human being to be borne aloft in a free balloon. It is further asserted that De Rozier lost his life on June 1, 1875, in a flight over the English Channel in a balloon of his own design. It is known that the initial flights of both De Rozier and of the Montgolfiers occurred in October of 1873, but since exact dates are not given, the matter of priority is still in doubt.

In conclusion, it should be said that it is impossible to cover, in the brief time at our disposal, more than a few of the outstanding contributions of pharmacists to science. But perhaps enough has been said to indicate that contributions have been made in great abundance. Such abundance, coming from a relatively small group of workers, can scarcely be considered as being accidental. It has been suggested that a partial explanation may lie in the fact that scarcely any other profession is committed to the knowledge and use of a number of sciences and at the same time is so closely in contact with the daily life of society and in touch with its needs as is this profession. Pharmacy is fortunate in having a history so rich in achievement. It is this heritage which offers encouragement to the younger generation of workers and proof of the existence of opportunities for everyone who enters its ranks.

The Place of the Scientific Techniques in the General History of Culture*

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It is a far cry from Edward Augustus Freeman's definition, "History is past politics," to a meeting of pharmacists and their friends gathered to honor the history of pharmacy. Politics is insufferably narrow as a definition of history unless politics is interpreted to include all the interests of the "polis" or the city-state as the Greeks understood the word. But it is unlikely even with this broad interpretation that Freeman envisaged a history of pharmacy as a subdivision of history more generally considered. In the half-century since Freeman's death, the historian's conception of his theme has broadened visibly. The explanation lies perhaps in the growing complexity of society and a resultant broadening of the recorder's task. Social history today must take account of the various techniques which minister to the society. At the same time those techniques appear to multiply as erstwhile subdivisions attain the dignity of major interests. The process bears some resemblance to the detachment of the iceberg from the glacier. Indeed, a glacial simile is not inept for an occasion like the present, for the main current of society, and therefore of history, sweeps on with the resistless flow of the glacier, whereas the specialized fragments into which the glacier subdivides eventually achieve a dignity and continuity which justify a section all their own in the card catalogue of the historian. In such a simile, the likeness of the whole historic process to the movement of a glacier can be readily sustained. The weakness of the glacial simile lies in the comparison of the detached fragments to so many icebergs, for the components in their turn carry on with a continuity resembling that of the parent stem.

A society may be considered ripe when its component interests have achieved an historic dignity all their own. Thus the self-conscious recognition by the various scientific techniques, including pharmacy, that their social contribution warrants a specialized historic record, testifies not only to

*Read before the Seminar of the American Institute of the History of Pharmacy, Purdue University, 1942.

the ripened state of the technique in question, but also to the varied richness of the entire social and historic process. The H. G. Wells's of the future must reckon increasingly with pharmacy and with many other techniques, some of them perhaps not clearly differentiated at this moment—as integrating factors in their future outlines of history.

Premising some such hypothesis as that of the glacier and its fragments, a contemplation of the place of the scientific techniques in the general history of culture involves some explanation of the origins of a scientific spirit precedent to the differentiation of the several sciences. And it is inevitably concerned with the alternating currents of advance or retrogression in a society which is as shifting as the seas. This in turn involves some explanation of the great historic gulf, bridged only recently and then but partially, between the scientific West and the contemplative East.

Few contrasts are, indeed, more notable in the "East is East" and "West is West" of Rudyard Kipling than their respective devotion to scientific versus abstract thinking. Assuming as all anthropologists do assume, save the benighted victims of Hitler's tyranny, that so-called Aryans have no monopoly of brain power and that the several races of mankind, with due allowance for geographic and historic differentials, possess a reasonable equality of cerebration, we are startled nevertheless, by the divergent paths which that cerebration has marked out. While the East, indifferent through the centuries to material comfort and reconciled to poverty, was cultivating philosophy, religion, and mystic speculation, the West was turned, perhaps accidentally at first, but more and more self-consciously as the centuries unfolded, to a frank materialism, a patient inquiry into nature's secrets, an unceasing effort toward the conquest and the taming of material environment.

Whatever the cause of this differential—and there are those who see in it merely the accidental and the adventitious circumstance that Roger Bacon, an English friar of the Thirteenth Century, was a Westerner who turned the Western mind toward scientific inquiry as distinct from divine revelation with which the friar's own church was satisfied, drawing inspiration as it did from the revealed religion of the Middle East—the differential remained as a decisive fact. The East

was philosophic; the West was scientific. Yet of Roger Bacon I speak hesitantly, as it is possible that Bacon's scientific spirit may have traced from the circumstance that he was a Westerner to begin with. Whatever the case, whether result or cause, in last analysis Roger Bacon, intellectual titan of the Thirteenth Century, is the acknowledged father of that scientific spirit which in all the centuries ensuing has differentiated East and West.

It is, perhaps, more than a coincidence that Bacon emerges as the Father of Western Science in the self-same century that the specialized science of Pharmacy was coming into being under the patronage of Frederick II, erstwhile Emperor of the Holy Roman Empire, latterly King of the Angevins in Naples and Sicily, a strange and ruthless monarch, cruel but enlightened, himself the epitome of pre-Renaissance culture.

At this point in what so far is my assumption that East is really East and West is really West, may I venture an observation that different as they seem, and destined apparently forever to pursue opposing ways, nevertheless East and West repeatedly have met. They are meeting right now, for that matter, with consequences that are wholly unforeseeable. They met, in fact, in this very Thirteenth Century; for that, carrying over into the Fourteenth Century, was the age of Marco Polo, the Venetian so famous for his journey to Cathay. They met in the Crusades, first preached in the Eleventh Century but continuing through several generations.

What I am endeavoring to suggest is that the wonderful Thirteenth Century, the century of Magna Carta and the first parliaments in England, the century of Mont St. Michel and Chartres, of Amiens and the Sainte Chapelle and other supreme expressions of Gothic architecture in Europe, the century of the highest flowering of stained glass for the cathedrals, the century, to repeat, of the differentiating of Pharmacy from its sister sciences, a century so rich in cultural advance on every front that it still is regarded by John La Farge and other mediævalists as the high point for all time of Western Civilization—this marvelous century, I say, to exaggerate the significance of which is totally impossible, marks the climax of a period wherein East was East no longer and West was West no longer. The twain had met in the Crusades to the Near East, the impact of which upon the western mind was infinitely dynamic. Not a pharmacist myself, of course,

nor even an historian of Pharmacy, I nevertheless suggest to the distinguished pharmacists here gathered that their science had its birth in the violent but intoxicating marriage of East and West as solemnized in the Crusades, with Roger Bacon to legitimatize the offspring, and Frederick II as best man. Such a phantasy takes liberties with history and science both, but it possesses elements of truth.

If inferences like this can be drawn with some assurance from the infancy of Pharmacy in one of mankind's eruptive centuries when every cultural impulse leaped to life, such inferences can be drawn with even greater certainty from the Nineteenth Century impact of Occident upon Orient—the awakening of Japan, the discovery at this very moment by Chinese, Hindus, and other oriental peoples, of the nationalistic spirit which has characterized the West since the breakdown of feudalism, the voyages of Columbus, and the emergence of the modern European states.

Nor is this new appreciation, not to say adoption, of Western learning, confined to war and politics. Seven centuries after Roger Bacon, the East has caught the spirit of scientific inquiry. Boundless resources await this scientific exploitation. The West may tremble that at last the East confronts her with her own peculiar weapons, implemented in addition with the selfless devotion of an age-long oriental mysticism. But these alarming possibilities are not our present theme. For us historians and pharmacists it suffices to record that the Orient of late, notably Japan and India, has made impressive contributions to science as we know it in the West, and to Pharmacy not least.

I have spoken of the wonderful Thirteenth Century as a period when culture advanced on all fronts simultaneously. In this apparently passing reference I was foreshadowing the central theme of the present paper, for it can be argued readily enough that scientific techniques do advance on a united front, a phenomenon of interest to pharmacists as well as other scientists, and a key to cultural history which the general historian dares not ignore.

This progress of which I speak has a cyclical character not unlike the expansion and contraction of values on the bourse. But the picture is never uniform. In periods of expansion, there are laggards; in periods of contraction, some

advance. It is interesting to note that on the blackest market day of 1929, with values shrinking hourly by the billion, one solitary stock actually closed higher. Similarly in the dreary Fourteenth Century, tragic contrast to its amazing predecessor, improvement can be yet discerned in one important phase of life, namely the economic. For the enormous human losses of the Black Death, estimated in parts of Europe to have destroyed four-fifths of the population, created a demand for labor so powerful as to raise the general wage level and to undermine the very foundations of serfdom and of an outworn feudalism.

Even Spain of the Seventeenth Century, wreck of its former grandeur, byword throughout Europe for the completeness of its ruin, a country in which no great king, no great general, no great industrialist, appeared for a full century; a country in which agriculture languished and whole types of manufactures perished, their trade secrets completely lost —even Seventeenth Century Spain, so lost to glory that ships lay rotting at their quays and kings could no longer pay their body guards, Spain the utterly demoralized, bequeathed to us the paintings of Velasquez, imperishable reminder of the Spanish Hapsburgs.

These isolated examples of a counter-tendency culled from periods of swift general decline provide a mild encouragement to the optimist but afford slight interest to the student of general progress, to the student, shall we say, of the place of the scientific techniques in the general history of culture. Such a study would find richer pabulum in the brilliant Sixteenth Century, those brave days of Great Elizabeth when Drake and his galleons scoured the seas; when marine architects were forging a sea-power that was in time to render half the world their country's tributary; when Shakespeare and a host of lesser lights illuminated English literature; when the Borgias and the Medici ruled among Italians, infamous but masterly; when Martin Luther set in motion the entire modern age of revolution; when in France Joseph Justus Scaliger in his famous "De Emendatione Temporum" published in 1583, was sponsoring Chronology, indispensable portion of the historian's equipment. Nor in this brilliant gathering of all the talents may we forget the pharmacist. The Sixteenth Century prototype of the ornaments of their profession gathered here this evening, was advancing in his art. Was it his

fault that his art was prostituted by the rulers of mankind to the service of their crimes? Where would Pope Alexander VI or Cesare Borgia, his son, have been without their blenders of poisons? Where would Catherine di Medici have been without her Ambroise Paré, illustrious surgeon, but skilled besides to remove the healthy from this world, and that with a maximum of mystery.

Is it not something other than coincidence, moreover, that the Seventeenth Century, age of English colonization in America, spanned by Galileo and Newton, the one dying the other born in 1642, memorable to the historian for Dom Jean Mabillon's *De Re Diplomatica*, epochal contribution to the auxiliary science of Diplomatic, was climaxed in another avenue of progress by Harvey's discovery of the circulation of the blood? And is it purely fortuitous that the Eighteenth Century, age of the enlightenment, age of Leibnitz and Voltaire, of the historian Gibbon and of Franklin, the inventor, was also the age of Albrecht von Haller, the anatomist and physiologist, who in the seventeen years of his professorship at Göttingen contributed approximately 12,000 articles on almost every branch of human knowledge to a monthly periodical of which he was the editor?

These examples suggest, after all, nothing more surprising than the rather obvious truth that in an age of general progress, many interests and techniques achieve an advance proportionate with the general gains of the society. In themselves they reveal no special interdependence. Such interdependence would be revealed most convincingly, I think, by a marriage of the physical with the biological sciences, if that could be effected. Such a marriage was actually solemnized, and with utmost pomp, only in our present century, when the biologist conquered the yellow fever and malaria of the tropic jungle and thus enabled the mechanical engineer and the civil engineer to build the Panama Canal. The story is an epic in the history of engineering and of science.

Men had dreamed of an isthmian canal since first Balboa discovered the Pacific, from a peak in Darien as the poet so delightfully reminds us. For some centuries it remained a dream. The vision came a step nearer to reality in the Clayton-Bulwer Treaty of 1850, which pledged Great Britain and ourselves to joint construction only. Thus the first serious step toward the Panama Canal lay in the field of politics and

international diplomacy. A well-intentioned step it was, but it grounded on the rocks of Anglo-American rivalry. Neither power in last analysis was prepared for joint activity. The English-Speaking Union as we know it now was scarcely operative in the Nineteenth Century.

Taking advantage of the deadlock thus resulting, Ferdinand de Lesseps, fresh from his engineering triumphs at Suez, conceived the project in the eighties of the last century, of doubling and redoubling present honors through rounding out a great career at Panama. Toward this end French capital was enlisted, and serious but unavailing efforts were directed toward propitiating the United States and the Hayes Administration. Soon the dirt began to fly. Americans today dismiss too lightly the achievements of the French Company. It did accomplish much, but at too great a cost. Bankruptcy resulted on the economic side; on the biological, the cost in human life could not be justified. The jungle finally prevailed. Engineering, mechanical and civil, was too far in advance of the biological sciences. The general advance of culture must bring these two great interests into balance before the greatest forward step ever contemplated in Geography could take effect.

This evening of the salient, so to speak, constitutes a proud chapter in the history of American medicine, in which pharmacy inevitably shares. The spearhead of this great advance was Walter Reed, heroic experimenter in tropic fevers. Cuba was Reed's field of operations. An enlarged application of his discoveries, with Colonels W. C. Gorgas and G. W. Goethals as medical engineers to render it effective, assured a joint triumph of science and of engineering which gives to Panama unique distinction as possibly the richest example of the interdependence of scientific techniques in a common frontal advance of general culture.

The parallel advance of science and technology is here the major interest. Other impediments there had been, but these were minor. Substitute the Hay-Pauncefote Treaty for the Clayton-Bulwer; purchase the Panama rights of the French Company; give Panama moral and perhaps other backing in her revolt from Colombia; and the trick is turned so far as Theodore Roosevelt is concerned. Some historians might be content with these details. If so, they would miss the essential significance of the Panama Canal as a landmark in the

history of Western Civilization. In a proper appraisal of this cultural achievement, it would seem as if a due perspective would rate the joint progress and interdependence of engineering and biology as of fundamental interest out of all proportion to the self-dramatizing tactics of the Sage of Sagamore Hill.

From events of such continent-cleaving import as we have just been contemplating, it is a return to earth to discuss a tiny incident in your speaker's own experience. But it is one that as an historian he will not soon forget. The story concerns what he likes to call the marriage of History and Physics. Some years ago he was asked by a woman's club to share a program with Professor R. B. Abbott, of the Purdue University Department of Physics. Dr. Abbott, as it happens, is joint inventor with an associate in Crawfordsville, Indiana, of a telephone-like device, of use in mineralogy and archæology, which rings a bell when it is placed above a metallic deposit or implement. As Dr. Abbott puts the case, fancifully of course, he is the first to have received a telephonic communication from the dead. This pioneer experience took place at Fort Ouiatenon when he located by this means a pewter vessel used for cooking by early Eighteenth Century Frenchmen who then controlled the Wabash Valley.

Encouraged by this interesting find, Dr. Abbott devoted some portion of a summer holiday to serious archæological and historical research in Washington County, in Western Pennsylvania. His objective was the last camp of General Braddock, as the General lay dying *en route* from his defeat at Fort Duquesne. Tradition has the camp just off the modern Route Forty, near Uniontown, Pennsylvania. Dr. Abbott was able to demonstrate that in the very nature of things the camp was many paces distant. The traditional camp-site rang no bells; whereas there was a pretty frequent ring from a point some distance off, where the telephone reported cannon balls, shells, horseshoe nails and numerous metallic relics of camp impedimenta. Excavation brought them speedily to light, and the museums of Washington, Pennsylvania, and Lafayette, Indiana, are enriched by these historic treasures of a physicist's research.

My part in the program which the ladies arranged with a view to dedicating these fruits of a physicist's research was indeed a minor one. I was merely the curtain raiser on a de-

cidedly dramatic scene. Reviewing Francis Parkman, I outlined the general background of Braddock's expedition. Dr. Abbott followed with a modest account of his own important aid in correcting a long-standing error of historians. The high moment of the evening came when the findings of the expedition were suddenly unveiled. I do not know whether I have conveyed the atmosphere of this occasion, but as an historian I found this contribution of a pure scientist a matter of peculiar interest. My justification for referring to it in the present paper is my conviction that in a modest way it does illustrate the simultaneous manner in which, even the interrelationship with which, different techniques advance upon a common front. For the historian is after all a portion of contemporary culture. He welcomes aid from all who will contribute.

Which brings me to a point of some debate. Should the professional historian constitute himself the historian of the several techniques or should he leave that highly specialized assignment to eminent practitioners therein? It is evident that no general historian can master universal knowledge. Aristotle in antiquity is given credit for such knowledge, but it is permitted to wonder. As late as the Eighteenth Century, Leibnitz was a living encyclopædia. But to claim for him universal knowledge taxes credulity. To no one since Leibnitz has such a compliment been paid. Modern culture is a congeries of specialties. The history of any one of these represents a specialty in itself. What mere historian could have written Dr. Harvey W. Cushing's life of the late Sir William Osler? The supreme brain surgeon of our time became the interpreter of the most dynamic force in Anglo-American medicine. What student of general history can rival the profound knowledge of our distinguished guest, Dr. George Urdang, respecting the history of Pharmacy?

When wars are past, whose memoirs attract attention comparable with the Ludendorffs and Pershings—men who know at first hand the problems of the high command? When whole eras are to be evaluated, who are more in demand than statesmen, for their version of the inner springs of action? The thinkers and the doers, the men who give direction to an era, are the natural meat for the historian, who is after all a fairly modest fellow. He knows his limitations. As his conception broadens his humility increases. In the more or

less traditional aspects of his craft, politics, economics, religion, war and diplomacy, statesmanship, literature, he produces sound and independent work. But when he ventures into the broader fields of general culture, seeking to depict the convergence upon the present of the manifold techniques which have had their varying expressions throughout the centuries—when, in short, the historian determines to be a Harry Elmer Barnes, an H. G. Wells, an Oswald Spengler—his task becomes encyclopædic, and he must rely upon specialists in many fields for guidance, specialists who in their turn are historians in their respective fields. His own work thus becomes synthetic. He interprets many currents of whose details he obviously is ignorant. Thus his work is vulnerable to criticism. But the more he risks, as in Wells's highly controverted "Outline of History," the more credit he deserves for his courage in creative synthesis.

In bringing to a conclusion these reflections upon the place of the scientific techniques in the general history of culture, I am tempted to introduce a note which is neither general nor philosophical but particular. I note that honor is accorded at these sessions to Carl Wilhelm Scheele, the great Swedish apothecary of two centuries ago. Scheele no doubt deserves these honors. Men are speedily forgotten. To survive two hundred years is a fair start toward immortality. But Scheele may find such eminence a trifle lonely and I would like to provide him a companion. My candidate for such an honor is the Apothecary Homberg,* a member of the household of the Duke of Orleans, nephew of Louis XIV of France, and destined soon to be Regent in the long minority of Louis XV.

The later years of Louis XIV were saddened by a sequence of deaths in the King's immediate family. The Grand Dauphin, the Duke of Burgundy, next in line, the Duke of Berri another grandson, hastened prematurely to the tomb. In the senior branch of the House of Bourbon a great-grandson alone remained to carry on the line. In circumstances so tragic for the royal house, so encouraging to the regal aspirations of the

*Wilhelm Homberg (1652-1715) was born in Batavia as the son of a German apothecary who was in the service of the Dutch government. Wilhelm Homberg never practiced pharmacy. He first studied law and was a lawyer at Magdeburg (Germany). Becoming interested in natural science, he studied physics and chemistry. His chemical investigations and findings were numerous and important. He produced boric acid from borax without, however, recogizing its real chemical nature. He was physician in ordinary to the Duke of Orleans and the designation "apothecary" given to him only expresses the fact that he was a chemist as well as if not even more than a physician.—Urdang.

House of Orleans, suspicion was directed toward the Duke of Orleans and his Apothecary Homberg. Upon hearing these scandalous insinuations, the Duke's Mother, Elizabeth Charlotte of Bavaria and the Palatinate, was infinitely shocked. In her voluminous correspondence—the most extensive correspondence, it may be noted, in all history—Madame has several references to Homberg. I quote from her own letters:

"I didn't think it possible," she says, "that anyone could say such a thing in earnest, but it was repeated to the King in all seriousness and he immediately spoke of it to my son. With unfailing kindness, he assured him that he did not believe it, but at the same time he advised him to send his apothecary, the poor scholarly Homberg, to the Bastille in order that he might clear himself."

The affair passed over, with no punishment for Homberg, who was not received at the Bastille. Madame was much relieved, for, as she declared, "To know Homberg is to like him. His mind is clear and not all befogged as the minds of scholars usually are. Nor has he their pedantic gravity, but is, on the contrary, always gay. All his learning, even on the most abstruse subjects, seems to be for him a pastime with which to amuse himself. He condescends to crack jokes and laughs at himself. I am sure you would like him."

To turn once more to the general, as befits our philosophic theme, may we not generalize of pharmacists today no less than pharmacists two hundred years ago, that their minds are clear and not at all befogged as the minds of scholars usually are? For is not Homberg the prototype of pharmacists today, scholars who are learned without pedantry, learned but still likeable? Thus speaks the historian of the pharmacist. May he hope in turn that the pharmacist will deal gently with the historian?

But the relations of pharmacists with historians, harmonious or otherwise, are infinitesimal in the cosmic reaches of our Western culture. That culture, scientific as we noted, subject to cycles of progress and of retrogression, advancing or retreating on a general front, capable of explosive releases of dynamic energy, torturing its votaries periodically with apprehensions of darkness and decline and the blotting out of empires—a civilization as restless as the sea—was never more puzzling than at present. Wars, incessant and devastating,

threaten the very foundation of our culture. Yet science refuses to bow its neck. Amid spiritual decay science registers its customary progress. Is this pursuant merely to inertia and will science ultimately yield to the decay of other intellectual and spiritual forces? Or will science hold the bastions of civilization until the spiritual forces of mankind can gird for a fresh and unparalleled advance along a wide front to a higher civilization than man has ever known? Here faith transcends experience. It points to man's redemption. In that day the arts and sciences will serve as hand-maidens of the spirit, ministering angels in man's groping toward a better day.

This is prophecy, of course, not history. Assuredly it is not science. Perhaps it borders on theology. But whether we conclude our theme with this prophetic optimism or yield, instead, to the profound discouragement of the tragic day in which our lot is cast, we know that the scientific techniques are woven into the very warp and woof of past and present culture. They are the companions of man's degradation, the agents of his progress. May they serve him with increased effectiveness in a brighter future than aught he yet has known!

The Post War Coresponsibilities of the Public Health Professions*

ROBERT L. SWAIN

Editor, Drug Topics

As we assemble here tonight to do honor to the graduates of the Schools of Medicine, Dentistry, Nursing and Pharmacy of this University, I am sure that we all rejoice in the radiant fact that good news is flowing in from the battle fields of this global war. While no one can say with certainty just when the war will be won, the signs are unmistakable that we have finally reached the outskirts of the beginning of the end.

*Commencement address delivered before the graduating classes of the schools of medicine, dentistry, nursing and pharmacy of the University of Tennessee, Memphis, Tennessee, June 14, 1943.

There are those thoughtful observers who sense the early collapse of our barbarous foes, both in Europe and Asia, but whether the collapse comes soon or late, come it inevitably will. The outcome of the war is not open to dispute. It will end with unconditional surrender of our foes, as any other terms would be an affront to our sense of national decency and national resolve.

So tonight, we may with complete assurance, look at the post war world as one which we and the brave peoples of Britain, Russia and China, not to mention the peoples of the "so called occupied countries," will unite in an effort to make another such catastrophe forever impossible.

We will find ourselves differing with respect to many basic facts. We shall not agree on many important problems, but the good sense, the sober judgment of the world, will evolve some mechanism which will make it impossible for another war of aggression and tyranny to be waged.

Certainly there must not be another such curse as the morally deranged Hitler brought to the world.

Permit me, also, at this time to extend congratulations to the members of the graduating classes whom we honor on this occasion. I am not a stranger to academic halls. I could expound at some length upon the value of your work at this university, and I could dwell upon the great adventures which surely await you. There is much which could be said upon your value to the world, and upon what the world will insist upon teaching you.

But, the hour is too momentous, and the time too filled with meaning for me to attempt to give proper emphasis to that upon which you have dwelled much, and upon which you have placed your measurement. So, again with congratulations, in all that the term implies.

However, tonight, I think we shall do well to leave matters of global statesmanship to others, as we seek a fuller understanding of problems specifically within our own fields. Just what do we, as members of the public health professions, face in the post war years? Will there remain the initiative, the sense of personal responsibility which has given America the finest system of medical care in the world, or will it become necessary for the government to step in because we ourselves failed to meet the test of the changing

times? Can medicine, and the other public health professions be entrusted with formulating a program for the expansion of medical facilities, for a more embracive distribution of medical care, or, in seeking our own selfish ends, shall we blind ourselves to the challenge of the more alert, the more socially minded?

Let us not seek to elude these questions, because they are not to be solved by any such non-courageous treatment. Let us not, either, deny that we shall be called upon to make our choice. Just a day or so ago, I read in the Baltimore Sun a news report which quoted Dr. L. Pierce Anthony, Editor of the Journal of the American Dental Association, as saying that governmental control of dental practice "is surely coming."

Faced with this prospect, Dr. Anthony said: "The only thing we dentists can do, as I see it, is to devise a plan of procedure fitted to the new order." While I deplore the defeatist attitude of my brother editor, I think his declaration does constitute a news item which we shall do well to bear in mind. As he sees the future, dentistry is to be practiced under governmental control.

In another news story which came over my desk, James A. Hamilton, president of the American Hospital Association, said that private hospitals must adapt their services to modern needs, or face replacement by hospitals owned, staffed and conducted by the government itself.

On all sides, we are faced with the threat of having the public health professions socialized, regimented and controlled as an instrumentality of the state.

Frankly, let me say that I deplore the prospect of governmental interference with the health professions. I abhor the possibility that these professions may come under political control. I tremble at the suggestion that our splendid systems of medical practice may themselves be under the hand of men who would bend these public health professions to political ends.

But, when I have made these observations, let me say that there will be the socialization and regimentation of the medical specialties, unless the medical professions prove themselves worthy of the leadership which they claim they are able to give.

Let us take a look at some of the problems which we face, and let us seek some analysis of the factual and emotional conditions from which they arise.

On the surface, one can hardly be expected to oppose the principles, purposes and objectives of the Beveridge plan, or its American counterpart, the cradle-to-the-grave program of the National Resources Planning Board. While the plan submitted to Congress by the President is a mere statement of rather obscurely defined objectives, and with no suggestion of how it could be financed or put in operation, no real objection can be raised against the spirit of the proposal.

Obviously, the scheme is an attempt, however visionary it may be, at social betterment. It bespeaks a warm-hearted solicitude for the general good. It appeals to our sense of decency, right, goodness, faith, hope and charity. It is, in fact, a cradle-to-the-grave program in which the federal government would assume the role of motherhood to the whole population.

But, when we learn that the cost to us in America would be between fifteen billion dollars and fifty billion dollars annually, we begin to wonder even if a country as vast and wealthy as ours, could afford so luxurious a social program. Obviously, such a proposal should be given the most thoughtful consideration, but we should bear in mind that if a grandiose social program were undertaken, only to be quickly abandoned, the whole urge for social betterment would suffer incalculable injury.

The duty rests upon the medical professions to protect the public against what may well prove to be its own folly. Any scheme, program, plan or purpose aimed at social betterment is bound to attract strong public support. There is always the urge to follow one's heart rather than his head. The collection plate is rarely turned away empty. The purpose being good, the means must be good.

The medical phases of the program proposed by the National Resources Planning Board should be left with the medical professions, certainly so far as feasibility, practicality and real need are concerned.

Pollyanna attitudes may be all right in some places, but certainly before the nation embarks upon so vast a venture

as the NRPB insists upon, it needs more than a cheerful smile and cherubic countenance.

It seems to me that the medical professions, and the whole public conception of public health progress, would take on a more appreciative appeal if the public really knew the true situation. For this reason, it would seem wise for us to consider some type of public relations work, such as is carried on by other segments of the population who know the significance of public opinion.

Now, in making this suggestion, I am not contending for a continuation of the status quo, but I am contending that there can be no understanding study of our medical needs unless the public knows from a factual standpoint, just what has already been accomplished.

Then, too, the medical professions have perhaps suffered in public estimation, because the public has formed its opinion from *ex parte* evidence. It has heard the clamor of those who insist upon governmental control over medical facilities and the distribution of medical care. It has heard well intended but woefully uninformed social workers bemoan the scarcity of medical attention and the inadequacy of medical care in many sections of the country.

It has read in the public press of the hard-boiled indifference of organized medicine, and it knows that the American Medical Association was convicted for violations of the anti-trust laws. The public reads and hears much about the shortcomings of medicine, dentistry, of the deterioration of pharmacy, but it hears little, precious little, from the professions themselves.

For instance, the public is *not* told that there is a lower incidence of disease in America than in any other country in the world. It is *not* told that the death rate has dropped to the lowest level in our history. It is *not* told that the life span has been lengthened by years and years in the past few decades. It is *not* told that contagious and infectious diseases have dropped so low that they no longer rate among the twenty or more major causes of death.

They are *not* informed with respect to the achievements of medical research, of the splendid progress in medical, dental, pharmaceutical and nursing education, of our unexcelled

hospital facilities. They know *very* little of the magnificent public health program now under way in virtually every state, nor do they know the viewpoints of the men and women making up the medical professions, the public health agencies, and the great drug production facilities of the drug industry.

Frankly, it seems to me that plans for the expansion of medical facilities and the distribution of medical care, if indeed such plans are inevitable, should come from the medical professions themselves. I think no one can argue successfully against the opinion of Dr. Morris Fishbein, that planning for post war medical problems must rest with the groups or callings most directly affected, and which must be looked to, to make the plans work.

Post war medical planning should be the responsibility of medicine, and the same holds good for dentistry, pharmacy, nursing, the drug industry and all other professional, social and industrial groups embraced within the confines of medical care.

Whatever plan or program may be worked out, must ultimately come back to the existing medical professions or allied groups. Certainly, the plan must appeal to their sense of what is technically sound, professionally feasible, and consistent with the known facts. No plan based upon a take-it-and-like-it attitude is likely to succeed, and none should be attempted.

The real danger, as I see it, is that the medical professions may be pushed or prodded into forsaking principles and precepts they know to be sound, simply as an escape from the pressure of those insisting upon socialization as the only means of meeting post war medical needs. Those clamoring for socialization are vociferous, persistent, plausible and persuasive.

There are signs that the medical professions are not immune to their influence. I find indications that many in the medical professions are sure that the time has come to join up rather than fight on. There is evidence that the spirit, the incentive, the force of character which once distinguished these groups, are beginning to show some effect of the eroding power of persistent criticism.

If the medical professions are obligated to protect the public against ill considered action, then certainly they are under obligation to protect themselves from such action.

While change may be necessary, desirable and inevitable, the medical professions do themselves and the public a distinct disservice when they permit themselves to follow a course dictated by mere expediency.

Now, let us take a brief look at the judicial career of the case instituted by the Department of Justice against the American Medical Association, as the possible effects of the case have not been too well explored, nor their meaning made clear.

No one knows how far-reaching the Supreme Court decisions in the American Medical Association case may be in the post war years. On the surface, at least, it would seem to open the door to the corporate practice of medicine, a possibility which would justify the government in leaving the control of medical practice to medicine itself.

Even a Court as high as the Supreme Court, is not qualified to determine what is best for the people where questions involving medical needs and facilities are concerned. The Court has said on more than one occasion that it cannot attempt to resolve differences of medical opinion, but it did not hesitate to take a positive position on questions which underlie the contrariety of medical points of view.

However, merely because there is the possibility that the way is open for the corporate practice of medicine, the duty rests upon the medical profession to soundly study the prospect with the purpose of again protecting the public against itself.

In connection with this matter, it should be made clear that permitting corporations to engage in professional practice has always been considered unwise as a matter of sound public policy.

A professional practice must of necessity be a personal, individual matter. It is something which certainly cannot be delegated to a corporation. For these reasons, at common law and in many states by statute, corporations are prohibited from attempting to practice a profession through the guise of hiring individual practitioners. And, in those cases when

the attempt has been made, the Courts have not hesitated to invalidate the whole deceptive and illegal set-up.

Now, of course, there may be no wholesale entrance of corporations into the field of medical practice, but if the possibility does not blossom into a reality, it will be due to the good sense, the dignity, and the innate responsibility of medicine, rather than any solicitude for the public good on the part of the august Court.

One of our chief concerns in the post war period will be the rehabilitation of professional education. While no one can state how great the damage will be, it seems inevitable that medical, dental, pharmaceutical and nursing education will come through the emergency substantially impaired. Care must be taken promptly to discontinue the easing up required by war conditions.

Now, we cannot permit ourselves a casual attitude to this matter. Already there are those who are calling for a continuation of streamlined and accelerated courses, and for an abrogation of entrance requirements. The point is made that if it is possible to do a satisfactory job in much less than four college years in time of war, why should it not be possible to continue to do so in times of peace? Why should men and women be barred by technical entrance requirements, when many of them could do the work well if given the chance? Now, the superficiality of these questions shows up with their asking, but even so, these questions are being asked, and they are being asked in such a fashion that we may have to exert ourselves to maintain the integrity of professional education in the public health professions.

It would of course be possible to call to mind many factual situations which seem to point to public control of the public health professions. And, I think we should be open-minded enough to recognize that this movement does not stem entirely from crackpots, or woozy-eyed reformers. It does not all originate with politicians or superficial demagogues. Much of it does, but not all.

There are many serious-minded men and women in America who very deeply feel that there are defects in the medical care picture which call for remedial action. They feel that there are problems to be solved which may not be well solved if the medical professions are alone permitted to solve them.

While I dissent from their views, I have too much sense to expect them to fade out just because I might wave them away. No, their views will cease to accuse only when we curselves meet the situation as it should be met.

I think also that the whole public health program would be sharply advanced if there were more practical, more understanding cooperation among the public health professions. For twenty years, I was a member of the staff of the Maryland State Department of Health, and I learned there just what is to be gained when there is an interchange of opinion among public health groups.

At the Department were bureaus devoted to child hygiene, communicable diseases, vital statistics, and other purely medical specialties, and these met with bureaus concerned with dentistry, pharmacy, nursing, food and drug control, sanitary engineering, not to mention others.

Cooperation and team work characterized the workings of the Department, an attitude which began with Dr. William H. Welsh who was President of the Department and permeated down through every bureau, branch or division. This cooperation expressed itself in matters of policy, public relations, legislation, and in all other respects bearing upon the state's public health program.

There seems no doubt, simply as an illustration, that medicine would gain if it were to use more intelligently the splendid professional abilities of the pharmacist. The pharmacist is the only person in the public health field who has been expertly trained in the many phases of drugs and medicines. At this university, the pharmacist has spent four years pursuing one of the medical specialities, and certainly has earned the right to be regarded as fully versed in his branch of medical science.

Much would be gained, so I firmly believe, if steps were taken to more closely integrate dentistry, pharmacy and nursing into medical practice, so that in meeting the disease problems of the day, our full professional health resources might be used. That there should be any opposition to such practical cooperation is more an indictment of hang-over prejudices than an indictation of present day enlightenment.

I am happy to state that some definite plans are under way in this respect. The American Medical Association and

the American Pharmaceutical Association have recognized the need for a more workable understanding between pharmacy and medicine, and already one meeting has been held between their duly appointed representatives to explore the whole situation, and to formulate a set of principles which should govern both callings in their interprofessional relations.

Your faculty has shown fine vision in the inauguration of the combined course of pharmacy and medical technology. Modern medicine cannot be practiced without adequate laboratory facilities. This combined course will prove a valuable asset to the medical profession and to the public of the smaller communities of your state. You are to be congratulated on the close cooperation of your medical and pharmacy departments in the formulation of such a course. It will bring out clearly the responsibility for health on the part of both the physician and the pharmacist. The opportunities offered graduates of this combined course will be very great. In towns where there is not sufficient laboratory diagnosis to support a full-time trained technologist, the combination pharmacist and laboratory technologist will perform an important health service.

As one great public health administrator once said, "there can be no practice of medicine without the aid of pharmacy, and there can be no practice of pharmacy without the aid of medicine." This being true, and none can deny it, then common sense demands that some plan be devised which will tap the full abilities of each, so as to make them mutually accepted and utilized.

I believe a careful survey of the whole field of public health practice will show that conditions would be generally improved by an intelligent integration of each of the public health professions represented here this evening,—into a more tolerant, a more broad, and with it all a more constructive public health program.

It is considerations such as these which have led me to feel that some such body as a National Public Health Advisory Council might serve a useful and beneficial purpose. Such an agency, made up of medicine, dentistry, nursing, pharmacy and perhaps a few others could provide a testing ground for national policy, and might well bring about the very kind

of interprofessional relations which seems so urgently required.

Such an advisory council might be compared on the one hand to a mutual assistance pact, and, on the other, to a clearing house for thoughts, plans and ideals designed to better public health relations throughout the country.

A National Public Health Advisory Council, properly constituted, would seem an ideal agency for harmonizing opinions and formulating policy in such matters as legislation, public relations, and in suggesting objectives which were mutually desired. I might say that it was the combined work of medicine, dentistry, pharmacy and nursing, working as a unit which was successful in the enactment of the basic science laws in many states. We might as well be practical and admit that in unity there is strength, and that united we stand, and divided we have a good chance to fall.

Some time ago, a group of interested pharmacists conceived the idea of a National Health Examination Week. This week would be devoted to educating the public to the need of periodic health examinations so that latent disease might be discovered and treatment begun. It was felt that such an endeavor would be greatly in the public interest, and that the whole health program would benefit tremendously.

Those who gave thoughtful study to the matter, saw the drug store as a strategic factor in such a project. Few realize that more than 20,000,000 people visit drug stores daily, a fact which gives the drug store such a potential value in consumer relations. It was this factual situation which has given rise to the statement that the pharmacist is the best single individual for the dissemination of public health information.

But, there has been no attempt to push the National Health Examination Week, simply because the fear has persisted that perhaps it lacked in dignity, or was in some other way inacceptable to medicine and other public health groups. Had there been a National Public Health Advisory Council, no doubt the proposal would have been submitted and discussed in the light of its merit, and relationship to the various public health points of view.

Now, in conclusion, let me express the conviction that the post war period will bring many new problems to the pro-

fessional groups represented here. There will be many diseases imported from Africa, the Orient, and other world battle areas. Malaria will likely become more widespread. We shall be faced with vast problems in the field of nutrition, and venereal disease will be still more dangerous.

We shall have more need for research, for ever better therepeutic products, for a mobilization of our scientific might, and for a fuller utilization of our professional resources. Unquestionably, there will be an intensification of public health needs, needs which will be a challenge to the professional capacities of the groups honored here tonight. The duty rests upon us to develop and preserve a true social outlook, and to so devote our talents that our professional work shall be in response to the growing social urge. The public health professions should maintain leadership in the public health fields, but they should never forget that heavy responsibility goes hand in hand with leadership.

We cannot defend our right to decide without accepting the obligation to meet the social needs of the times and to work everlastingly for better health programs and for better living conditions among all classes of people in all sections of the country.

Let me repeat that much as we may deplore governmental interference with the public health professions, we must be aware that failure on our part to meet our responsibilities to the full in these changing times, will leave the government no alternative but to move in and take over. We can maintain our supremacy and independence in the public health fields if we can show, without hindrance or restraint, that we are capable of the leadership which we so proudly proclaim.

It has been a great privilege to participate in the program of this glorious occasion, and to share with you the joy of these Commencement exercises. Let me again congratulate the members of the graduating classes in medicine, dentistry, nursing and pharmacy for a tough job well and faithfully done. May God's blessing rest upon you as you gird yourselves for the challenging adventure which lies ahead. That you will prove yourselves worthy both of your professions and this great University, we have no doubt.

And so, chins up as we move on to victory and peace!

Biographies as Material and as Subject of the History of Pharmacy

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The eminent part of the biography within the recording of the history of mankind is beyond discussion. Whether we consider the great individual the decisive factor of development or believe in the determining influence of the general social situation, the "milieu," as laying the ground for the activities and the efficacy of the great individuals, it is always by human beings that history is either made or suffered.

1. *Biographies as Material of the History of Pharmacy*

Biographical writings may be divided in those written by the individuals about themselves, so-called autobiographies, and those written by another person either during the lifetime or after the death of the subject of the biography. To the first category belong not only writings attempting to survey the entire life and work of the autobiographer but also reminiscences of every kind whatsoever. To the latter belong all notes and remarks concerning the respective individual wherever they may be found and for whatever reason and from whatever person they may be written down.

It is obvious that the obligation of the historian to find out and to point out the truth and nothing but the truth irrespective of sympathies and antipathies does not encounter anywhere, if more difficulties than in the evaluation of the material formed or to be formed into biographies. There is an emotional element in the dealing with the lifestory of individuals requiring special caution. Does that mean that biographies have to be written or to be conveyed to students in a dry form stating the data concerned without giving the horizon under which they happened or which they even helped to arch? Naturally not! That would be a violation of historical truth. The mere enumeration of data is statistics, and it is vision, based on logic and psychology and controlled by responsibility, which transforms statistics into history.

It is the fate of the great majority of autobiographies to present a picture which is somewhat out of proportion, at

least as far as the perspective is concerned. The fact that the author of necessity places himself in the center of all that happens very often accentuates excessively the impact of his actions, observations and explanations. It seems peculiar and is yet but natural that the prospect of getting an unsophisticated picture is inversely proportional to the stature of the autobiographer and his ambitions.

The simple individual describes what actually was going on and it is up to the historian to find out the definite meaning of it and to complete the picture by giving it the background and the test of the general trends and circumstances of the epoch concerned. The great or ambitious or politically minded individual is mostly not so much interested in giving an objective report of the facts as such, as in expressing his own opinion about them and what he thinks to be their meaning. His autobiography is very often nothing else but an attempt at excuse or explanation, or finally even at persuasion of contemporaries and posterity to see him, his life, his work and his achievements as he wants them to be seen. Here the historian has to examine the subjective statements and conclusions as to their justification and has to clarify the psychological situation.

It is the remembrances of veteran pharmacists, in earlier times a regular feature in pharmaceutical journals, which present the first mentioned, the more photographic type of biographical writing, so to say. Here the authors have nothing to excuse or to explain and their ambitions as to posterity are not big enough to justify an attempt at persuasion. They dwell in the events and facts which made out their life. In these remembrances the historian of pharmacy has very valuable sources as to the general professional or trade circumstances of the period concerned. Naturally the dates and data have to be checked. In general, however, it is astonishing how correct the authors of these remembrances are, how exact the account is that is given by them.

There is no doubt that the facts reported in the autobiographies of more ambitious men are likewise, if not even still more accurate. But the writing of these men represent—intentionally or unintentionally—a continuation of the fight for certain ideals or for personal recognition which had formed the essentials of the active life of the authors. The two best known autobiographies of renowned pharmacists, the *"Erin-*

nerungen aus meinem neunzigjaehrigen Leben" (remembrances of ninety years of life) of the apothecary and professor of pharmacognosy at the University of Erlangen, Ernst Wilhelm Martius (1756-1849), as well as the book *"Erlebtes und Erstrebtes"* (What I experienced and what I strove for) of the apothecary and professor of pharmacognosy at the University of Basel, Alexander Tschirch (1856-1939), are excellent examples of this type of biographies. In both cases the authors deliberately wrote not only personal remembrances but general pharmaceutical history, centered more or less around their own person. They evaluated and they even set values.

In using such autobiographies as source material, the historian of pharmacy has to try to get his own idea of the personality and the work of the autobiographer based on other sources. People endowed with the gift of and the liking for self confession and explanation without which the writing of an autobiography is inconceivable, have mostly had literary controversies, stood in some movement, had influence and used it. That has to be followed up and the figure emerging from this research will sometimes not only look different from the one built up in the autobiography, but our findings will frequently make us discard some of the statements and conclusions of the autobiographer.

It is of highest historical as well as psychological interest to compare the point of view taken from different autobiographers in regarding and describing the pharmaceutical situation of their time. If we study the two autobiographies mentioned above we very soon observe, that the one author, Martius, being not only a university professor but for the greatest part of his life simultaneously owner of a pharmacy, felt himself as a part of practical pharmacy. To him the practice of pharmacy was the alpha and the omega, the starting point as well as the last objective of all endeavor which could or should be called a pharmaceutical one. Tschirch who had practiced retail pharmacy only in fulfillment of the educational requirements leading to the degree as *Apotheker*, had devoted himself exclusively to scientific and educational work and felt himself not as a part but as a censor and counsel of practical pharmacy.

There exists, furthermore, another autobiography, which represents not only the most famous of all memoirs contain-

ing pharmaceutical reminiscences, but also a third point of view toward practical pharmacy. It is the book *"Von Zwanzig zu Dreissig"* (From Twenty to Thirty), written by the well known German novelist, Theodor Fontane, who was the son of a pharmacist and a pharmacist himself before he, in the end of his twenties, changed definitely the pestle for the pen. His point of view is that of a man who having personally risen to greater heights of life, devotes to the professional and social conditions of his youth that peculiar mixture of benevolence, condescendence and malice which undoubtedly is amusing but naturally does not warrant an objective picture. It must be said that this attitude is the general one in the autobiographic writings of most of the people who, starting as pharmacists, earned recognition in other sciences or professions or in the world of business. Nevertheless, these memoirs are of highest interest for the pharmaceutical historian. Their authors combine inside knowledge of pharmacy with their adopted outside attitude towards the profession of their early days and the kind and degree of their adaptation of outside judgments and prejudices is extremely illuminating.

Finally there is the romanticizing autobiography. As to pharmacy their most characteristic representatives are the autobiographic novels *"Der Lehrling zum Koenig Salomo"* and *"Der Gehuelfe zum Koenig Salomo"* (The apprentice and the clerk in the pharmacy at the sign of King Salomo) which the German author of very popular fairy tales, Ludwig Bechstein, wrote on the basis of the pharmaceutical experience of his youth. It is obvious that the inspirational and atmospheric value of autobiographies of this kind exceeds by far their importance as sources of detailed historical information.

The biographies of more or less important individuals written by some other person are dominated by reflections of another kind. If we want to subdivide them into categories, we may differentiate between 1, the eulogy; 2, the analytical study; and 3, the colorless performance which places more weight on a most complete enumeration of all dates and data than on their meaning and on the definite placement of the individual concerned within his given surroundings.

The eulogy is the most frequent of these three types of biographies. Following the old Latin rule *"de mortuis nil nisi bene"* (of the dead nothing but good should be said) it dominates the obituaries. In Germany from the 16th to the late

18th century the printing of funeral sermons for the purpose of distribution among friends of the deceased was a wide spread habit and much of the information we have about German scientists and pharmacists of these centuries we owe to such sermons. All of them are full of exaggerated praise and the high epithet "immortal" is spent liberally even for very modest merits. Hence obituaries and funeral sermons can be used as historical sources only as far as the definite facts, the dates of birth and death etc. are concerned. All evaluations of the personality of the deceased, of his work and of his position in social life have to be regarded with utmost precaution.

Even if a biography or a biographical sketch is not written with the intention of making it a eulogy, it very often is far from being objective because the author is in love with his hero, or professional or scientific group ambitions are in the play.

It is for this reason that the critical and analytical study represents the most rare type of biography. It is naturally this kind of biography that ranks highest from an intellectual point of view and sometimes even from an artistic literary one. Instead of sentiment reason is given. We are on firm ground for discussion and argument. The aim is conviction and not persuasion, and it is indeed only by this method that the real greatness of the hero becomes obvious. As an attempt of this kind the writer's booklet on Carl Wilhelm Scheele may be mentioned, published by the American Institute of the History of Pharmacy on the occasion of the bicentennial of the birth of the great apothecary-chemist (1942) in 1943.

The third type of biography, the mere enumeration of material concerning the life and work of the respective individual does not require any explanation. In fact these publications, as valuable as they are, cannot be regarded as "biographies," but as preparatory work for a biography. Here the bibliographies, the lists of all publications of the man in question and, to be found very seldom, of publications concerning him, are especially valuable. The comprehensive biography of C. W. Scheele compiled by the Austrian, Otto Zekert, and published by the *Gesellschaft fuer Geschichte der Pharmazie* (Society for the History of Pharmacy) between

1931 and 1935 presents an example for a happy balance between a eulogy and a most complete collection of dates and data.

In summarizing the survey on the value of biographies as material of the History of Pharmacy the following may be stated:

1. They offer dates and facts which often cannot be found anywhere else. That holds especially true for autobiographies because personal interest made the authors take notice of events and individuals which otherwise would not have gained attention. Dates in autobiographies should be checked, whenever possible, because notoriously the authors often have trusted their memory in giving them.

2. They offer a general picture of the period of time concerned built up of many details which are of extraordinary general historical value. Thus the autobiography of Martius and the novels of Bechstein picture in detail the social position of the pharmaceutical employee and the professional-scientific education of the apprentice in Germany between 1770 and 1840. The position of the pharmaceutical employee and the atmosphere of the German *Apotheke* between 1840 and 1870 is pictured in the autobiography of Fontane, and the autobiography of Tschirch closes the century with the description of the time between 1870 until the end of the 19th century.

It is significant that Martius, the least ambitious individual of the three autobiographers mentioned above, offers the most detailed report and the most objective view, and that Tschirch, doubtless the most ambitious of the three, dwells most on anecdotes and on the recording of his connections with and his opinion about contemporary celebrities.

In most biographies the connections of the individual concerned with other persons, his friendships and rivalries play an important part. For this reason the material offered in biographies about other individuals may often prove to be of highest interest.

3. They offer special material which may be used for historical work in most different directions. Thus Zekert's biography of Carl Wilhelm Scheele contains an alphabetically arranged list of all the compounded preparations which were

manufactured in the laboratory of the pharmacy at the sign of the Unicorn at Gothenburg (Sweden) compiled by C. W. Scheele's oldest brother Johann Martin Scheele. It contains furthermore a *"Catalogus"* listing the medicaments, instruments and supplies with which the same pharmacy around 1750 furnished the ships sailing from Gothenburg over sea. It publishes an inventory of all goods, medicinals, bottles, jars, instruments and all that belong to the pharmacy *("Inventar ueber alle Materialwaren, Medizinalien, Flaschen, Buchsen, Instrumente und all das was zur Apotheke gehoert")* giving simultaneously the prices of all items, and an inventory of the library of the owner of this pharmacy, the apothecary Martin Andreas Bauch, dated 1755.

Hence this biography contains material on pharmacy in the 18th century pertaining to the materia medica kept in store in the average pharmacy as well as to the preparatory activity of these stores and of the books on which they based their work and the scientific education of the apprentices. Even the historian of pharmaceutical economics may find in this biography something of interest to him.

As far as I know, no comprehensive biography of an American pharmacist, autobiographical or other, has ever appeared on the bookmarket. There is, however, one biography published in the Midland Druggist and Pharmaceutical Review during the years 1911 to 1913 which I think worthy of the restricted immortality of a book. It is "The Memoirs of an American Pharmacist, James Winchell Forbes (Edited by J. H. Beal)." Like in most good American autobiographies, the story of the hero is inseparably connected with that of this great country, and his personal ventures and adventures were but an individual offspring of the unique venture and adventure whose name is America.

James H. Beal who gave the memoirs of J. W. Forbes (1831-1911) their final shape, called the autobiographer "a pharmaceutical knight-errant." It does not diminish the value of these memoirs to the profession that Forbes stayed with pharmacy by chance rather than by onesidedness of talent or purpose. He certainly was strongly attracted by the peculiar mixture of technical skill, applied science, and finally applied ethics which pharmacy represents. It corresponded in some way with the variety of talents that was his, and it

left sufficient space for allurement and the joy that change meant to him. J. H. Beal, himself one of the most versatile men in American pharmacy, described the psychological phenomenon, Forbes, wonderfully as follows:

"Mechanic, professional hunter and trapper, California argonaut, gold miner, Indian fighter, druggist's apprentice, introducer of new drugs into the materia medica, deviser of new pharmaceutical preparations and of new processes for old ones, composer of popular music hall sonnets, orchestra leader, proprietor of theatrical organizations, writer of acceptable fiction, magazine editor, composer of classical music, almost a poet—he traversed nearly the whole gamut of things possible in a nascent civilization and sounded a loud and clear note at each step of the scale." (Midland Druggist and Pharmaceutical Review 45:282, 1911.)

Naturally, there is scarcely one individual of prominence in American pharmacy who has not been honored with a more or less detailed biographical sketch on the occasion of his death, or of some exceptional event in his life or career, and, as stated before, reminiscences of old pharmacists formed until about the first world war almost a regular feature of our professional trade journals. William A. Brewer, Sr's "Reminiscences of an Old Pharmacist," published during the years 1884 and 1885 in Pharmaceutical Record (vol. 4 and 5) may be regarded the prototype of old men's stories in American pharmacy. There are many excellent, partly even exemplary biographical essays scattered all over the American pharmaceutical press. L. F. Kebler's essay on Andrew Craigie (Journ. Am. Pharm. Assoc. 17:63, 167, 1928), M. I. Wilbert's biographical sketch on John Michael Maisch, (Am. Journ. Pharm. 75:351, 1903) and Ivor Griffith's pamphlet on Frederick Belding Power (Am. Journ. Pharm. 96:601, 1924) may be mentioned as examples and as patterns. To these three authors American pharmacy is indebted for a series of biographical sketches on American pharmacists of importance published in the Am. Journ. Pharm. or in the Journ. Am. Pharm. Assn.

In the glossary of the Kremers-Urdang History of Pharmacy these sketches are mostly quoted among the references added to the short notes on the individuals concerned. Hence it does not seem necessary to repeat these quotations. Mention has, however, to be made of the series of biographical

sketches published on "Some of the Early Teachers in Pharmacognosy in America" by Henry Kraemer (Am. Journ. Pharm. 88:385, 433, 1916) and on "Eminent Men in Pharmacy" by F. J. Wulling in Pharm. Era 1893. Series of the same or a similar kind have been published by a host of more or less informed authors in the Pharm. Era as well as in the other professional drug trade journals through the ages. Mostly they represent compilations from all possible unchecked sources and have to be used cautiously and reservedly. An excellent biographical source as far as American pharmacists of the 19th century are concerned offers the golden jubilee issue of the Druggist Circular, Vol. 51, No. 1, 1907. Biographies of men connected with pharmacy, whose work was devoted to scientific or industrial chemistry, may sometimes be found in the series of essays that the Journal of Industrial and Engineering Chemistry has been running for decades under the title "American Contemporaries."

It is understood that all books on the history of pharmacy contain biographical notes. Often histories of medicine, chemistry, botany and of natural sciences at large will furnish welcome material. As to American pharmacists the history of The First Century of the Philadelphia College of Pharmacy including its supplement volumes, covering the time from 1821 to 1941, and Curt P. Wimmer's history of The College of Pharmacy of the City of New York, covering the time from 1829 to 1929, offer plenty of reliable material. Since 1940 there appears in the Bulletin of the History of Medicine a Bibliography of Medicine in the United States and Canada including in its list of biographies those on pharmacists.

Of special pharmaceutical biographicons, attempting to list all pharmacists of more than local and ephemeral merit are to mention J. A. Hæfliger's Biographicon in Tschirch's *Handbuch der Pharmacognosie*, second edition (1932) and F. Ferchl's *Bio- and Bibliographikon* (1937). Pharmacists with exceptional merits in the field of natural sciences are listed in J. C. Poggendorff's *Biographisch-Literarisches Handwoerterbuch zur Geschichte der exakten Wisschaften*, the first two volumes of which appeared in 1863, and in John Ferguson's *Bibliotheca Chemica* (1906). In the last mentioned standards as well as in the histories of medicine, chemistry, botany, etc., the fact that the men concerned were pharmacists or came from pharmacy is naturally given little or

no attention. Biographies of pharmacists working in the field of therapy and pharmacognosy at the end of the 19th century can be found in the book of Reber *"Gallerie hervorragender Therapeutiker und Pharmakognosten der Gegenwart,"* Geneva, Switzerland, 1897. Finally, Bolton's Chemical Bibliography, published by the Smithsonian Institute, although not containing biographical notes itself, lists biographies on men with merits in chemistry. It goes without saying that general biographicons and reference books, e. g., the Dictionary of American Biography, the Dictionary of National (English) Biography, The Encyclopedia Britannica etc., may be used with advantage. As to French pharmacists much biographical material is contained in the volumes of the Journal of the *Société d'Histoire de la Pharmacie* (*"Bulletin"* from 1913-1930, then *"Revue D'Histoire de la Pharmacie"*). As to German pharmacists the biographical part of Adlung-Urdang, *Grundriss der Geschichte der Deutschen Pharmazie* (1935) may be consulted.

2. *Biographies as Subject of the History of Pharmacy*

It is understood that most of the statements concerning biographies as material of the history of pharmacy may be used as guides by the presumptive author of a biographical sketch or a complete biography.

First of all he has to avoid what has been marked as the most frequent weakness of biographies, i. e. the eulogy and the undue concentration of all light upon his hero. He has to employ the analytical method. Analysis means examination as well as the separation of compound substances into their components. We have to do both in order to write a good biography. We have to examine all dates and data as to their correctness and we have to separate the complex compound, represented by the given life and work of our hero, into its components. Inheritance, influences of childhood, early experience forming the character or creating a specific general attitude towards fellowmen, all that has to be considered. On the other hand to the pharmaceutical historian the psychological illumination of his hero is only a means not the objective. His objective is to truly picture the part the respective individual has played in and for the time concerned especially as to the development of pharmaceutical science, education or practice. How can that be done?

First, the material has to be collected. It is desirable to have some reliable dates about the parents of the hero, their activities and social standing. In order to get this material we have to find out to what church and to what societies they belonged and whether there are entries in the books concerned. Local newspapers have to be perused. The municipal accounts of transactions of houses and real estate have to be searched. The courts may furnish dates. Sometimes local historical societies can be of help. Relatives may own letters or may be able to give more or less reliable reports. As to the childhood of the hero reports of relatives or classmates or autobiographical notes as they exist surprisingly often may furnish the required material.

However, all that is of minor importance. The family background of the hero and his childhood are of interest only as elements forming the character of the man. This formed character and what he achieved, i. e., the man and his work, are the real subject of the biography that we have in mind. The search for material has to go on in the following order: On what school (type) and by what men (types) has the hero got his professional schooling? When did he start his own work and what kind of work was that? What positions did he occupy and for what time, and what special work did he perform there? What professional and personal contacts did he have? Did he belong to associations and did he play an active part in the one or the other? Were there press feuds or other quarrels in which he was involved? How was his family life (children) and what hobbies did he have? What place can he be given within the professional or scientific or even social world in which he lived?

As to his works first of all as complete a bibliography as possible has to be compiled. Publications in book form will not offer any difficulties. They are mostly known and available. With essays it is quite different. Reprints are often missing and cases in which the author has left a complete list of the articles written by him are rare exceptions. For this reason all the journals have to be searched which possibly could have served as places of publication.

The most difficult part of the biographical task is the evaluation of the importance of man and work concerned. In order to get that done satisfactorily, we must examine the gen-

eral development so as to ascertain in what state of affairs he found the field of his special activity and how he left it, and finally where he got his impulses from. What was his own independent action and what was mere reaction? How was the general situation? Was it against or for him? Contemporary men and work in the same field or in related ones have to be considered and paralleled. Finally it is important to investigate the kind and the degree of recognition our hero was given because they reflect the authority which he enjoyed and the influence exerted by him.

Biographies belong to the most fascinating features of history. About them is the charm and the mystery of life and death, of fight and adventure, of failure and success. They represent courts of justice as well as of honor and are invaluable sources of inspiration. Their authors assume responsibility towards the past as well as towards the future.

The Degree of "Pomp and Honor"

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Today with accelerated courses and speedy graduation, academic ceremonial has been excessively curtailed. Our surviving convocations with academic processions in full regalia of cap and gown and hood are merely vestigial souvenirs of the pageantry which the Spanish-American universities adapted from their European contemporaries of the 16th and 17th centuries, and which later came to North America from England.

By a royal decree the Emperor Charles established requirements for degrees in his American universities. A bachelor of medicine or surgery might practise his profession without the further study required for the doctorate and the expense of receiving that "degree of pomp and honor."

Regulation was necessary because there were occasional struggles between the apothecaries and barber surgeons for the right to treat patients. This was accomplished by the appointment of a protomedico.

A typical doctor of medicine of the 16th and 17th centuries in Spanish America is pictured in Juan de Vega, who held numerous important offices and grasped at more. Ricardo de Palma describes him as "dressed in black kneebreeches, shoes of plush with stone buckles, coat and waistcoat of velvet, crossed by a heavy silver chain with pendant seals," and the distinctive item a pair of chamois gloves.

Such was his favor with his patron, the Viceroy of Peru, that when he was accepted as a doctor of the faculty of the University of San Marcos, most if not all of the attendant fees were remitted him by Viceregal decree.

The fees and gifts and entertainments were prescribed by law; wherefore only the well endowed could attain a doctor's degree, unless by special decree remitting all or part. The only exception was the privilege (by law 73) of graduating with half the fees, which was enjoyed by the sons of doctors, masters and professors in the University. Also by provision of the governor, the collegians of the Royal Major College and certain collegians sustained by His Majesty in the College of San Martin, were excused from the elaborate supper or dinner following the events.

The picturesque ceremony called the "Promenade of the Doctor" opened the festivities at three in the afternoon of the day preceding the granting of degrees. A cavalcade of friends, officials of the university, and of the government, all on horseback and richly caparisoned, preceded by musicians with trumpets, kettledrums and clarions, and followed by pages and lackeys in the livery of the new doctor, escorted him from his house through the principal streets of the city and returned him there.

Since the universities were founded first for theological degrees, medicine which followed partook of a religious flavor. The degrees were bestowed in the portico of the Cathedral Church, whither the same company of the preceding afternoon accompanied the recipient at nine in the morning.

Led by the musicians and friends on horseback the University Guild came next. Beadles in long robes of purple velvet carried silver maces with the arms of the sovereigns of Castille, and after them filed the chief syndic, the treasurer of the university, and then the doctors of the various schools,

theologians, canons, lawyers and doctors of medicine in doctor's cap and classic hood. Their gowns were bordered with the traditional colors of each faculty: yellow for medicine, red for law, violet for arts and green for theology, which we note differs from today's designations.

Next came the attorney-general and royal auditors, then the pages and lackeys, and finally the candidate walking between the rector of the university and the dean of his faculty, and sometimes the viceroy. They were followed by a man-at-arms carrying the doctor's cap on a golden staff, and by the guardian of the diploma.

The ceremony was long, complicated and fixed by law. On the terrace were seated gentlemen of quality with the state and university officials. Tables with silver salvers held the doctoral insignia: cap, ring, book, sword, and spurs. Other salvers held the fees and gloves which the recipient owed to the University.

Mass was celebrated before a small altar, and then the aspirant pronounced his doctoral thesis and answered questions of the rector, a doctor and a student. Next he was subjected to a satirical criticism which he had to accept and answer with good humor. After which he requested his insignia.

This was bestowed by the dean who gave him a kiss in "sign of brotherhood, friendship and union." The doctoral ring, the book, the sword and spurs were presented also. Then kneeling he professed his faith, after which the master of the school gave "with Pontifical and Royal Authority," the hood and degree of doctor.

He was seated with the viceroy and authorities while the fees and gloves were distributed, and then the procession reformed and returned him to his house. There he was host at dinner, and later in the afternoon he provided for a bull fight in the main plaza of the city. All this was prescribed by law, even to the sumptuousness of the dinner.

Each of the insignia or ornaments and the actions—the kiss, the blow with the hand—had traditional symbolism: The hat or cap was a symbol of liberty; slaves did not wear hats. The book signified knowledge, and the ring marriage to science. The kiss welcomed him to the brotherhood, the

blow on the shoulder survived from the knightly accolade. The sword and spurs symbolized the war against disease.

A sample list of fees and gifts required: 150 reals to the university chest, 130 to the rector, 100 each to the sponsor and the master of the school, 90 to each doctor of the faculty, 50 to the other doctors, and 30 to the masters of arts. The rector and doctors also received velvet hoods and the clergy caps, or 40 reals in place of these.

Each doctor also received 6 hens, 4 pounds of sweetmeats and a pair of gloves. Double this was given to the rector. To the master of the school and sponsor each 8 hens, 6 pounds of candy, masters of arts 3 hens and 2 pounds of candy and gloves. To the secretary 80 reals, 2 pounds candy and gloves. To the chief beadle 70 reals, 2 pounds candy and gloves. To those who had part in the questioning 70 reals and 40 to the doctor in charge, and these with the beadles and secretary ate at the house of the graduate.

Though we are not told the cost of hens and sweetmeats, which were no doubt less, and gloves which were no doubt more than today's prices, these gifts together with the various fees listed might total over 4000 reals. In addition there was the dinner to be provided, one law requiring a deposit of 200 pesos (1600 reals) to assure its being of suitable quality and quantity. The graduate must also provide bulls for the afternoon bull fight; how many and their cost is not listed, but 100 pesos each is a conservative guess.

With the real valued approximately at 12½c in present currency, an overall cost of more than $1300 is assumed, and it is small wonder that only the sons of rich families could aspire to the doctorate, unless a student had a royal scholarship or a benevolent patron. Because of this, by the beginning of the 18th century much of this ceremonial had fallen into disuse.

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The Place of Business Administration Subjects in the Pharmacy Curriculum*

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One of the most notable changes in American university education during the last generation has been the recognition of the place of collegiate business education and of the fact that schools of business education can, and do, train young men and women in such away as to increase their usefulness to the world of business and thus to add to the probability of their later success. Although the movement for university work in business began as early as 1869 when General Robert E. Lee, then president of Washington and Lee University, recommended the establishment of a school of business as an integral part of that university, it was not until the middle of the 1890's that the Wharton School of Business Finance of the University of Pennsylvania began to show just what could be accomplished by collegiate business training. Since that time, practically all of the principal universities and many of the liberal arts colleges have joined in the offering of courses in Business Administration which now have a firm and established place in American education. In many institutions the schools or colleges of Business Adminstration are among the largest units of these organizations.

Education for business has succeeded only because the policies which have guided its development have been sound. Although handicapped by a sometimes too ambitious program and by many attempts to teach on the campus what may be learned only by actual experience, this type of education is now on a sound basis because administrators have come to know what can and cannot be taught on the campus to prospective business men. One group of courses seeks to explain to students the basic principles of the world in which they must do business. Illustrative are courses in principles of economics, economic history and political science. Another group of offerings furnishes essential tools for business con-

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trol such as accounting, statistics and business mathematics. Still other offerings seek to give to the students a realistic picture of established business procedures customs and methods. Thus work in the fields of business finance, marketing, factory management, insurance, foreign trade and business law, prepare the student for business by teaching him a knowledge of the terms, institutions and basic practices in these and other like fields of business. Other courses seek to impart a degree of skill or technique. Among these are the offerings in advertising, merchandising, personnel, purchasing, salesmanship and sales management.

It is the firm conviction of those of us who have been training future business men for many years that courses such as those just mentioned, when combined with training in the older fields of the liberal arts, and with certain courses in engineering, education, and pharmacy, give to our students the ability to think through to a straight conclusion. To a degree, at least, they furnished the raw materials for business thinking. Work on the job necessarily continues the training process but the student who has benefited from the offerings of the present day collegiate school of business enters active business life with a great advantage. To a great degree, he knows what he will there find and how the principal business problems are being, and have been solved. Scrutiny of the records of business administration graduates discloses that the observations just made are substantiated by the success of such graduates as a class.

Many leaders in the field of pharmaceutical education have come to believe that the training of professional pharmacists might well include certain work which has been developed in the schools of business and particularly so if certain adaptations might be made to enable standard business courses to fit into the needs of future pharmacists in the most effective manner. A brief examination of why this conviction is so rapidly growing is now pertinent.

We pause here to emphasize the dual nature of the task of the pharmacist. The successful pharmacist must combine the functions of a professional man with those of a merchant. Although the proportional time spent in each activity varies from store to store, every druggist must function in the two manners. In the filling of prescriptions, the handling of poi-

sons and narcotics, and in the distribution of biological and medical supplies, the pharmacist is functioning as a highly trained professional man. For such training there can be no substitute. Other parts of the pharmacists's activity, such as the sale of tobacco, cosmetics and sundries, make but little demand on his professional knowledge. But there is a great middle ground of activity in every drug store which combines both professional and merchandising activity.

If proprietaries are to be priced properly, the pharmacist must know his original costs, the overhead involved in handling them, the direct selling costs and incidental expenses such as delivery, packaging, etc. The right solution to this phase of merchandising involves a knowledge, first of consumer needs and then of accounting, of inventory turnover rates, of methods of determining mark-on percentages and the essentials of cost accounting procedures. Yet, even then, the price is not clearly revealed for every successful pharmacist knows that there must come into play at that point a very subtle but essential consideration of the merchandising aspects of price setting. Knowledge of close-at-hand competition, trade practice, and of consumer reactions must be carefully weighed. Unless this is done, the pharmacist may not arrive at a price which will both yield to him a profit and allow him to continue to enjoy repeat visits from his *customers*. Training in merchandising while attending the school of pharmacy should go far in helping him to solve this and other problems.

New times bring new problems. Today the pharmacist is facing new types of competition. Changing conditions of manufacture and in retail channels of distribution have brought about essential developments which must not be overlooked by the pharmacist who hopes to remain long in business. The development of manufactured pharmaceutical specialties to their present importance in the modern drug store naturally lessened the proportionate time previously spent by the pharmacist in compounding individual prescriptions. Widened consumer demands for proprietary medicines and toiletries suggested the possibility of securing them at some merchandising outlet other than drug stores and has brought on additional retail stores carrying these lines. Department stores, variety stores, "patent medicine stores," cosmetic shops, gro-

cers and super-markets have all taken away considerable portions of lines which were for years thought of as belonging only to a retail druggist. Only good merchandising can bring this business back to the pharmacists or even keep it from escaping to a still greater degree.

That this point of view is shared by many thoughtful pharmacists is shown by two recent actions. Harry S. Harrison, upon taking over the presidency of the Baltimore Retail Druggists' Association, said, "I hope that our colleges of pharmacy may be able to give more practical training in commercial pharmacy. I do not mean that they are going to throw out any of the established courses but I have noted over and over again how handicapped our graduates are in meeting the real thing."

Just this summer, the Michigan Retail Druggists' Association at its meeting passed a resolution urging the American Association of Colleges of Pharmacy to include comprehensive courses in business administration within its curricula.

It is now pertinent to ask just what business administration courses should prove to be the greatest use to students of pharmacy. One is certainly a course in accounting. Although retailers as a class have been relatively slow in recognizing the importance of exact accounting records of business transactions, there is now wide spread recognition of the absolute importance of knowing the state of one's business and only accounting can reveal such information. Income tax requirements have made a minimum of record keeping, that which reveals profit and loss, imperative. But the druggists who stop with only the minimum accounting records are failing to use the tools which are available to make their success more probable . . . accounting must be used for records which reveal rates of stock turnover and are thus a guide to buying and to proper mark-on calculations. Accounting records enable the druggist to make many useful comparisons with the results obtained by successful druggists as made available by various firms which are interested in the druggists' welfare. The druggist of tomorrow will not, in the judgment of most close students of drug store merchandising, be able to operate his store as though it were just one accounting unit. He must segregate line costs i. e. departmentize his business into at least three or four departments and even more in the case

of the larger stores. Increasing competition from department stores, variety stores and super-markets will make careful line costs a necessity. They can be obtained only by careful record keeping and by the application of the elementary principles of cost allocation.

If the future pharmacist is to be trained along these lines, it is believed that this may be best accomplished by including in the pharmaceutical curricula a required course in accounting. The content of such a required course should be especially adapted and applied to the problems of retail drug store operation. Many such courses are even now being given because leaders in the field recognize the imperative nature of the problem in part because of the recent development of textbooks and other course materials especially prepared for such instruction.

A second essential course of instruction in business training for pharmacy students deals with the day-to-day merchandising in the retail drug stores. Often known as a course in store management, this offering presents to future pharmacists the essential principles and procedures used in the daily management of a drug store. It should include a simple treatment of the principles behind the type of the community to be served, the selection of a location, the proper layout of the store, good buying practices, and the successful ways of promoting the sale of the various lines of merchandise.

A large section of the course in Store Management should be devoted to methods of promoting the prescription as well as the other departments. Practice should be given in the proper methods of cooperation with physicians in the preparation of newspaper and direct mail advertisements and in the installation of sales making window displays. Experience in other areas has proved that much effective teaching may be done in the field of retail salesmanship. Although no teacher of that subject would assert that it is possible to make a salesman of every student, the poorest sales prospect may be given much of value to him. It is suggested that such a course should be carefully coordinated with the daily problems of the many students who are working in drug stores on a part-time basis and that it should, and must be a required course.

A third type of useful course for pharmacists deals with

the marketing of drugs and pharmaceuticals. A part of such a course is necessarily the same as the content of the standard course in principles of marketing found so commonly in not only schools of business but in colleges of arts, engineering, home economics, and agriculture. The principal facts relating to the distribution of products from the manufacturer to the wholesaler and retailer to the consumer are presented in such a course and with them the reasons for the development as it has taken place. The advantages of the different types of retail institutions as well as the handicaps under which they work, are important to any future merchant. Price policies of manufacturers, wholesalers and retailers are presented in detail as are the various types of legislation affecting the marketing of drug products such as the Robinson-Patman law, the Sherman Act and the state and federal laws governing fair trade contracts. Such a course, when adapted to the special needs of pharmacy students, goes far in giving them a proper knowledge of the background of their business and of the many external factors which must be considered in its successful operations.

In summary let it be said that although many other courses commonly taught in colleges of business administration are of definite value to the future pharmacists, as to all business men, it is recognized that the present curricula in schools of pharmacy necessarily include many courses indispensable to future pharmacists. For this reason, only three basic courses have been suggested as required courses: accounting—store management—marketing. Although they should normally occupy 10 to 12 hours, or about 10 per cent of the approximately 120 semester hours in a four year curriculum, yet they deal with subjects upon which the future retail pharmacist, unless he is employed in a strictly professional pharmacy, will spend at least 75 to 90 per cent of his time. Possible recognition of these significant relationships accounts for the growth of courses of the type described in our progressive schools of pharmacy.

"As to the 24 month program, it seems inconceivable to me that a state university would be willing to sell its birthright in order to obtain a few students under the pretense of the war emergency." J. Allen Reese.

Pharmacological Problems Arising from the National Formulary*

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The purpose of this brief discussion is to outline some of the pharmacological problems which arise from a consideration of certain drugs and preparations of the National Formulary. It is the purpose of this paper only to suggest some possible problems for further research and in no way is it meant to imply that these problems are necessarily being studied by or for the National Formulary.

The basic function of the National Formulary is to standardize drugs and preparations which are used by the pharmacist largely on demand by the physician. The term standardize is used here in its broadest sense and is not confined to a narrow concept of simply measuring, as important as that may be. But when one thinks of standardization the first thought is measurement, which to pharmacology means bioassay.

There are several National Formulary drugs which are at the moment sufficiently understood, in the sense that their basic mode of activity is known, to warrant their bioassay. Now that it has been established by Krantz, Munch, Lynn and others that the genuine viburnums definitely possess uterine sedative activity, it seems but logical to apply a bioassay unless a better means of control can be found. Since official bioassay methods based upon uterine activity are available, the development of a bioassay method for the viburnums should not be difficult.

Now that the Pharmacopœia has adopted the cat assay for digitalis, it would appear to be expedient to change the assay of tincture of strophanthus to the cat assay also. The National Formulary Committee is considering that possibility at the present with the valuable aid of several industrial and research laboratories, but any additional contribution from other researchers would be more than welcome. It is neces-

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sary to establish with great care the toxicity of the tincture as compared with ouabain in cats for it is to be anticipated that this toxicity ratio would not be the same as it is in frogs.

Senna, and more particularly its preparations, is another drug for which a bioassay should be considered. Although a bioassay might be impractical from the viewpoint of legal control, a carefully developed method would be of inestimable value in studies on the stability of various senna preparations such as the fluidextract or for determining the chemical nature of active fractions. At present, the Geiger mouse method seems to be helpful and its usefulness will increase in proportion to the exactness with which directions can be written.

Many other drugs which are now official could be bioassayed to advantage, if suitable methods were available. In addition several drugs could be made official if assay methods which were sufficiently simple could be developed. For example, there is evidence that the liver contains a factor, exclusive of the anti-pernicious anemia factor, which is effective in the treatment of secondary anemias. The development of simple but efficient methods of bioassay which would lead to the official recognition of such a product would be a distinctive service.

In the assay for digitalis, the Pharmacopœia has given recognition to modern statistical methods. However, the problem of statistical measurements as applied to bioassays needs to be studied very carefully and extended. The thoughtful addition of modern biometrics would be a milestone in the history of the National Formulary.

A number of drugs which are at present recognized by the National Formulary need further study in light of modern pharmacological methods. Many such drugs were used originally entirely on an empirical basis. While in many cases the empirical basis was not justifiable, the drugs do possibly have desirable qualities. Gelsemium is a case in point. This drug is used in the treatment of trigeminal neuralgia. Since one of the most frequently mentioned toxic manifestations of gelsemium is its muscular relaxant action, it is quite possible that the drug possesses curare-like properties which may be partially responsible for the relief of the neuralgia. In addition, it is probable that gelsemium possesses some autonomic properties worthy of mention.

Chionanthus has been recommended for the treatment of jaundice. Admitted that liver function is difficult to measure experimentally, the effect of this drug on hepatic secretory activity could be determined, as could its effect on the smooth muscle of the biliary duct and the gall bladder.

Corydalis, originally introduced as an anti-luetic agent, is valueless for that purpose. However, it does contain a minute amount of alkaloids of the isoquinoline series, of which bulbocapnine is the most prominent. Bulbocapnine has an activity for the central nervous system, producing in small doses a peculiar catatonic state and in large doses characteristic clonic convulsions. A careful study of this drug may be of value in understanding the physiology of the central nervous system, and a study of related compounds of the series, both naturally occurring and synthetic, might lead to compounds of pharmacologic and therapeutic importance.

One of the most important services that the National Formulary has to offer is the development of convenient dosage forms for active medicaments to be used by the physician. In the past, these preparations have been developed almost exclusively on the basis of the pharmaceutical properties of elegance and compatibility. Dille has recently shown that the barbital in elixir of barbital is very poorly absorbed from the gastro-intestinal tract, probably because of the high glycerin content. Although clinically this may not be disadvantageous for producing sedation, it shows the need for pharmacologic considerations in formulations of this character. Perhaps, the vehicle interferes with the absorption of other therapeutic agents as well.

The National Formulary is studying the possibilities of hydrophilic ointment bases and osmotically balanced opthalmic solutions. Both of these problems could be effectively aided by pharmacological studies. In the case of the eye solutions, it is important to have objective proof that the *p*H and the osmotic pressure do not decrease the value of the medicament and that the balanced solution is less irritating to the cornea and the conjunctiva. In the case of the hydrophilic ointment bases, it is important to know the relative absorptive capacities of different bases and to have physiological measurement of the efficiencies with which the medicament can leave the base to become available to the tissues.

The therapeutic activity of many National Formulary preparations is the net result of the interaction of more than one medicating agent. Studies on the synergistic and antagonistic action of the compounds in many of these combinations are sorely needed. Recently, it became advisable to make changes in the formula for Compound Pills of Mild Mercurous Chloride due to the shortage of mastic. Since these pills still perform a valuable function in the armed services, it is important that changes would not depredate the value of these pills in any way. Yet there is no data available, with which the author is familiar, which clearly indicates whether the deletion of the mastic produces pills with no loss in activity or whether the mastic should be compensated for by an increase in one or more of the other constituents.

Space permits only a glimpse into pharmacological problems stemming from the National Formulary, but suffice it to say that pharmaceutically minded pharmacologists can make many substantial contributions to science by working in their field without the necessity of looking elsewhere.

The Drug Garden as a Teaching Aid in Pharmacognosy

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Pharmacognosy at its best is one of the most interesting of the biological sciences. Being a biological science it should be taught from living rather than dead material. Of all of the teaching aids that may be employed in pharmacognosy or pharmaceutical botany, the drug garden is probably the most useful. It has been said that a picture is worth a thousand words but it is likewise true that the actual object is worth a thousand pictures.

The first and most important service of the drug garden is to enable the student to see a plant as a whole rather than as a single part. The relationships of overground and underground parts are more easily perceived. The differences between roots and stems are more quickly apparent. The struc-

ture and arrangement of leaves and flowers are more readily discerned. It is much better to study a plant in its entirety and then to examine its component parts, than to study these parts first and then try to visualize the complete organism.

The second function of the drug garden is to furnish laboratory material for both pharmacognosy and pharmaceutical botany. Fresh material is much more adaptable to laboratory techniques than is dry material. Sections are more easily cut with less distortion of structure. The student of pharmaceutical botany will appreciate plants more if he can work with drug plants. The actual study of a living plant from a seed to a mature structure yields much more information than merely reading about these various stages in its life history.

The third service of the drug garden is to give students practical experience in crude vegetable drug production. Methods of planting, cultivation, collection, and preparation may be illustrated by actual experience. The reasons for the varying tolerances for impurities given in the official monographs can be appreciated more when the drug is actually prepared from the living plant. It can then be readily seen, for example, why underground plant parts in general yield more acid insoluble ash than overground parts. Anyone that has cultivated and collected digitalis can understand why this leaf usually has about twice as much soil with it as belladonna leaf.

At the present time when most of our vegetable drugs must be obtained by domestic production rather than by importation there is a serious shortage of pharmacognosists with drug plant cultivation experience. Graduate and undergraduate studies in connection with the drug garden would qualify many students for this type of work.

The drug garden has the final function of furnishing material for other courses in the pharmacy curriculum. The student obtains a better understanding of vegetable drugs if he can follow them from the living plant through their conversion into the official form and then make their useful preparations such as the tincture, extract, spirit or fluidextract. The crude drug or its preparations may then be assayed chemically or biologically for its active constituents. Digitalis is one of the most important vegetable drugs that lends itself

well to this type of study and a summary of its usefulness from a teaching standpoint is given below.

Subject	*Use*
Pharmaceutical Botany	Structure of a typical leaf
Pharmacognosy	Planting Cultivation Collection Preparation Powdering Identification Preservation
Practical Pharmacy	Official preparations Preservation of products
Drug Assay	Moisture determination Acid insoluble ash determination
Pharmacology	Pharmacological action Toxicology Therapeutic use
Biological Assay	Cat method (U. S. P.) Frog method Biometrical interpretation

The usefulness of a drug garden is not limited by its size. It may consist of only a few flower pots in a sunny window or it may comprise several acres of ground. It is not within the scope of this paper to discuss the optimum size or equipment necessary for a drug garden. These items vary considerably according to the climate, finances, number of students and labor available in the different parts of the country. We have found that the pharmacognosy classes supplemented by paid student labor can well care for a drug garden of considerable size.

Selecting drug plants to grow in a drug garden should be done with the following things in mind. The plants should represent a cross section of the plant kingdom. All of the subdivisions, classes and subclasses of the spermatophytes should be included. The individual plants selected should yield most of the official plant parts and most of the common active constituents. The following list of twenty-two drug plants that are suitable to practically any climate is a good basic selection for a drug garden. Included in this group are plants

that contain volatile oils, alkaloids, glucosides, mucilages and resins, and the plant parts represented are roots, rhizomes, leaves and tops, flowers, fruits and seeds.

Aconitum napellus	Digitalis purpurea
Althea officinalis	Foeniculum vulgare
Artemesia absinthium	Hyoscyamus niger
Atropa belladonna	Ephedra sinica
Cannabis sativa	Iris species
Carum carvi	Lavendula spica
Chenapodium ambrosoides	Marrubium vulgare
Conium maculatum	Mentha species
Coriandrum sativum	Verbascum thapsus
Datura species	Nepeta cataria
Ricinus communis	Brassica niger

This basic list of plants may be supplemented by many plants that are indigenous to the various regions of the country. About the only drug plants that cannot be grown without special equipment in most schools are the more exotic tropical plants. Even these can be easily grown in some of our southern states.

It is hoped that in this short paper some of the basic values of a drug garden to pharmaceutical teaching have been pointed out.

The Identification of Powdered Vegetable Drugs by Color Reactions

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Powdered vegetable drugs are usually identified by one of two general methods. The first method entails the accurate knowledge of the microscopic characteristics of all of the drugs. When working with only a small number of drugs such as those official in the U. S. P., this method is very suitable for student use. The second method consists of using a key or outline based on the color of the powder and on the microscopic parts that may be present. In searching for a key

that could be adapted for use by sophomore students it was found that most of these were not suitable. Keys based on the presence or absence of crystals or starch were difficult to use because in many cases these characteristics could not be accurately determined. Keys based on the colors of powders are also unsuitable because the color and interpretation of the color differed greatly between powders and between students.

Because of these difficulties a method has been worked out by means of which the powders are classified into major groups by their color response to three common reagents. The reagents used are Iodine reagent containing 0.5 per cent iodine and 0.5 per cent potassium iodide, Iron reagent containing 1 per cent ferric chloride and 0.2 per cent hydrochloric acid and Alcohol reagent containing 0.2 per cent hydrochloric acid. These reagents are made up in 95 per cent ethyl alcohol.

The Iodine reagent is essentially a test for starch and for certain alkaloids and oils. The Iron reagent is a test for tannins, phenols and certain glucosides and the Alcohol reagent is used as a control. The technique of the test is as follows:

Place equal quantities (about 25 mg.) of the powder in each of three spots of a porcelain spot plate (Coors #00). To each of the spots now add the appropriate reagent drop by drop until the powder is just moist. Then add one drop excess of the reagent. The colors are now "developed" by filling each spot with distilled water and stirring if necessary. Allow one minute to elapse before reading the colors. To spot 1, add the Alcohol reagent; to spot 2, the Iodine reagent and to spot 3, the Iron reagent.

First compare spots 1 and 2. If the Iodine reagent produces a definite blue or black color the reaction is considered black-positive. If a red-orange color, not that of just the iodine or the drug, is produced the reaction is red-positive. If there is no difference in color between the spots the reaction is negative. Iodine reagent alone when diluted with water produces a faint yellow color.

Compare the colors in spots 1 and 3. If the spot with Iron reagent is blue or blue-black the reaction is considered blue-positive. If a green color, not that of merely the drug, is produced, the reaction is green-positive. If there is no definite color change the reaction is negative.

The drugs have now been delineated into eight major groups.

Group	*Iodine Reagent*	*Iron Reagent*
I	Negative	Negative
II	Negative	Green-positive
III	Negative	Blue-positive
IV	Black-positive	Negative
V	Black-positive	Green-positive
VI	Black-positive	Blue-positive
VII	Red-positive	Negative
VIII	Red-positive	Green-positive

For identifying the drug after its group has been determined a key based on the presence or absence of the most easily observed microscopic parts such as trichomes, stone cells, fibers, cork and so forth is used. A sample key for one group is given below.

GROUP III

I Stone cells present
  A. Fibers present
    1. Crystal fibers present ..... QUERCUS
    2. Crystal fibers absent ..... VIBURNUM OPULUS
  B. Fibers absent
    1. Lignified pitted parenchyma ..... NUTGALL
    2. Heavy-walled endosperm ..... ARECA
    3. Oil glands present ..... PIMENTA

II Stone cells absent
  A. Leaf tissue present
    1. Calcium oxalate prisms present ..... UVA URSI
    2. Calcium oxalate rosettes present ..... CASTANEA
    3. Seed coat fragments present ..... EUPHORBIA
  B. Leaf tissue absent ..... STILLENGIA

Out of about 150 powdered drugs included in our key only 25 gave questionable color changes. These have been included in more than one group so their identity can still be determined easily and accurately. This method has been found very suitable for sophomore pharmacognosy students and could probably be extended for more advanced work.

The author wishes to thank the following students for their assistance in working out this method: Verna Munson, Dolly Mettler, Deloris Perley, Mary Elizabeth Vadheim and Albert Bot.

Functional Groups in the Teaching of Incompatibilities*

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One of the problems which confronts the teacher of pharmacy today is that of effectively teaching the incompatibilities of organic compounds. Thousands of synthetic organic products are now in common usage in medical practice, and the pharmacy student must be so prepared that he can meet any challenge which these compounds may bring in the course of his compounding experience. No matter which of these drugs is prescribed, he must know whether it can be dispensed as prescribed and must be able to suggest an improved prescription if the one he receives contains incompatible ingredients. It is obvious that any systematization which can be done by the teacher will be of great value to the student not only in his study but also in his ability to remember what he has learned. It seems inadvisable for the teacher to discuss compounds individually, presenting the incompatibilities of each in turn, if any organization of material can be accomplished. In other words, the instructor needs to build for the student a sort of "intellectual hatrack" upon which he can hang an assortment of random ideas which might otherwise seem entirely unrelated.

The most obvious method of bringing about such organization of synthetic organic drugs would seem to be through the use of functional groups, those groups which determine, for the most part, the chemical nature and reactivity of the compounds.

In this paper will be presented a summary of a method of teaching certain facts pertaining to the incompatibilities of organic compounds which is now being used by the author in his class in dispensing pharmacy. The discussion is limited to the incompatibilities encountered in solutions for the obvious reason that the generalities involved are based upon our knowledge of the reactivities of molecules in solution. Furthermore, it is realized that in the preparation of solu-

*Prepared for the Conference of Teachers of Pharmacy at the 1942 meeting at Denver.

tions two of the most important facts which a pharmacist must know concerning any compound are: (1) the solubility of the compound and (2) the reaction (acidity or basicity) of a solution of the compound. This paper will be primarily concerned with the understanding or anticipation of these properties.

Solubilities and Functional Groups

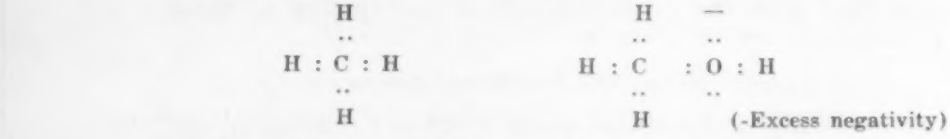
One of the most valuable assets which any pharmacist can possess is a thorough knowledge of the solubilities of compounds. Every day the pharmacist encounters numerous situations which require him to exercise this portion of his knowledge; it is like a spatula or a mortar and pestle which he must have available for use throughout his working hours. Further emphasis of this point hardly seems necessary since it is so apparent to all of us. A pharmacist without a knowledge of solubilities would be like a military officer with a regiment of troops but no knowledge of battle tactics.

Because of rather recent developments in the physical chemistry of solutions it is possible to present a number of correlations between solubilities and chemical formulas which constitute, so to speak, a set of solubility rules of organic compounds (1).

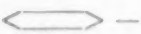
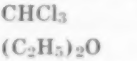
The first solubility rule to be discussed is one which has been known for a long time and is oft repeated: *A substance is most soluble in that solvent to which it is most closely related in structure.* This rule is so well known as to require little comment. As an example of the functioning of the rule may be given the increasing solubility of the mono-, di-, and tri- hydroxy benzenes, which demonstrates the increasing solubility in water as the number of hydroxyl groups in the compound is increased. Another example is the decrease in water solubility of the aliphatic alcohols and the increased solubility in benzene as the length of the carbon chain is increased.

The second important rule of solubility is based upon the Debye-Hückel theory of dipole moments (2). The rule, simply stated, is this: *Polar compounds tend to be soluble in polar solvents and non-polar compounds tend to be soluble in non-polar solvents.* If students have an understanding of electronic configurations in organic compounds, it is very easy

for them to grasp the conception of polarity or non-polarity which results from these electronic configurations. Thus, methane is theoretically an ideal non-polar compound, while methyl alcohol is quite polar:



Though not a direct measure of dipole moments, the dielectric constant of a liquid is a good indication of its polarity (3). As proof of the validity of this solubility rule, one may consider a list of the dielectric constants of a number of liquids and compare the values of the dielectric constants with the mutual solubilities of the compounds. A brief list of dielectric constants (4) is presented here:

Compound	Dielectric	Compound	Dielectric
HOH	81		5.2
CH_3OH	32	$CHCl_3$	5.2
C_2H_5OH	26	$(C_2H_5)_2O$	4.4
C_3H_7OH	22		2.3
C_2H_5Br	10	CCl_4	2.25
CH_3COOH	9.7	$CH_3(CH_2)_4CH_3$	2.0

One must not be misled by this second rule into the belief that non-polar compounds and polar compounds are never miscible or that compounds of comparable polarity are necessarily mutually soluble. Thus, ethyl bromide is very soluble in carbon tetrachloride because of similarity in chemical nature even though there is a great difference in their degrees of polarity. In other words, *the second rule must not be isolated from the first but must be used only to modify conclusions based upon the first rule.*

The third rule is based upon the solubility behavior of the functional groups of organic compounds. These groups are usually either acidic or basic in nature. According to this rule *compounds with acidic groups are soluble in basic solution and compounds with basic groups are soluble in acidic solution.* Of course, weakly acidic or basic solutions are implied here, since strongly acidic or strongly basic solutions might be injurious to the compounds.

The following list of functional groups is taken with slight modification from Kamm (4):

Basic Groups

$-NH_2$, $-NHR$, $-NR_2$ } Amines

Sulfonium hydroxides

oximes

pyrones

Acidic Groups

$-COOH$, carboxyl

$-SO_2OH$, sulfonic

arsonic

Ar-OH, phenol

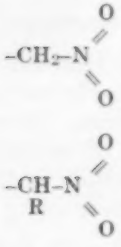
$-SO_2NH_2$, sulfonamide

imido

$=NOH$, oxime

ArSH, thiophenol

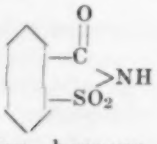
enolic type



I or II nitro

Other groups could be included, but this certainly includes all of the common ones.

Since most pharmaceuticals are frequently used or administered in aqueous solution, this latter rule would seem to be the most useful of all, particularly when it is used to predict the type of salt of a compound which must be produced in order to render it soluble. Thus, supposing a student is asked to dissolve Procaine, $H_2N\langle___\rangle COOC_2H_4\ N(C_2H_5)_2$ It should be immediately obvious to him that the compound, because of its basic functional group (NR_2), will be soluble in acid solution—for example, dilute HCl. It should also be obvious to him that the hydrochloride of the compound, since it is ionized, would be a readily soluble salt.

Saccharin,  , on the other hand, is soluble in basic solution because of its acidic sulfimido group. Likewise, the ionizable sodium salt of the compound (soluble saccharin) is readily soluble in water.

This discussion could be extended indefinitely by the presentation of a multitude of examples; however, these may be easily obtained by one who is interested. It must be noted, however, that only the more important generalities have been presented in this discussion of solubilities. There are many minor points which may be presented if desired. For example, nothing has been said about degree of solubility, though some predictions are possible; likewise, no consideration has been given to the relative strengths of the functional groups when several of these are contained in the same compound. For these further points one may refer to the several textbooks cited.

The Importance of Functional Groups in Incompatibilities

One might contend that all the preceding discussion has been wasted because medicinal products are marketed in the soluble form. This is true. However, if the student has mastered these principles of solubility, he is ready to take the next important step, which is the prediction of incompatibilities through an understanding of solubilities.

In order to proceed with the discussion it is necessary to interject at this point the well-known fact that most organic acids or bases are weak acids or bases as compared with the inorganic reagents. In other words, acetic acid has a lower degree of acidity than hydrochloric acid, and aniline lacks much of being as basic as sodium hydroxide in the same concentration. Salts of these compounds, then, for the most part act in a similar manner as buffer salts to produce when dissolved, not neutral solutions but weakly acidic or basic solutions. Thiamine hydrochloride, for example, gives a solution (1 in 50) which is acid to litmus, because the free base thiamine is feebly basic, while the free acid HCl is a strong acid. Solutions of sodium phenobarbital are slightly alkaline in reaction because they are salts of the weak acid phenobarbital and the powerful base NaOH.

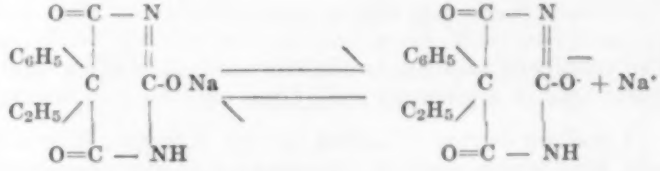
We should make the further assertion at this point that, as the first rule would indicate, most of the free organic acids and bases are insoluble in water and must be in the form of the soluble salts before they are soluble. In other words, *unless our knowledge of a compound's structure or our experience tells us otherwise, we should assume that a free organic acid or base will be relatively insoluble in water.* It is much easier to assume insolubility of all organic acids and bases and learn the exceptions than to memorize solubilities for all of them.

A thorough familiarity with this principle should give one an understanding of many incompatibilites. For example, the following prescription is often given as representative of a type of incompatibility:

℞

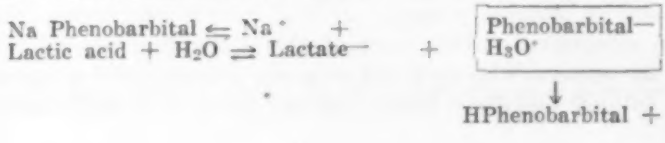
Sodium Phenobarbital,	gr. x
Elix. Lactated Pepsin,	fl. oz. ii

The acid of the elixir liberates free phenobarbital, which is insoluble and precipitates. This is easy to visualize if we apply the principle discussed above. The sodium phenobarbital probably exists in solution in accordance with the following equilibrium:



or some modification of it. At any rate, a solution of sodium phenobarbital must have a certain degree of alkalinity in order to exist in solution.

If the prescription were filled as written, the hydronium ion produced by the lactic acid of the elixir would convert the phenobarbital ion to the insoluble acid phenobarbital, which, in precipitating, shifts the reaction to the right:



This latter scheme is based upon the well-known generalization which is fundamental in chemistry: *ions will combine if a slightly soluble or slightly ionized product be possible.* It is exactly comparable to the well-known explanation of buffer action:

$$NaAc \rightleftharpoons Na^{+} + \qquad \left[\begin{array}{l} Ac^{-} \\ H_3O^{+} \end{array}\right] \rightarrow HAc + H_2O$$

$$HCl + H_2O \rightleftharpoons Cl^{-} + \qquad \text{(Undiss.)}$$

The only difference between the two examples is that phenobarbital precipitates as it is formed while acetic acid is removed from the reaction because it is only slightly dissociated.

To take another example:

℞

Cocaine Hydrochloridi	gr v
Sodii Boratis	gr x
Aquae, q. s.	ad fl. oz i

The cocaine hydrochloride dissociates in solution in accordance with some modification of the following equation:

$$\text{Cocaine HCl} \rightleftharpoons \text{Cocaine } H^{+} + Cl^{-}$$

(The resultant solution is slightly acid, indicating that hydrochloric acid is a stronger acid than cocaine is a strong base).

If sodium borate is added to this solution, it will liberate basic ions which convert the cocaine to the free base which is insoluble. In the schematic diagram which follows, sodium hydroxide is used to illustrate the mechanism of this precipitation:

$$\begin{array}{rcl} \text{Cocaine HCl} \rightleftharpoons & \left[\begin{array}{l} \text{Cocaine } H^{+} \\ OH^{-} \end{array}\right] & \begin{array}{l} + Cl^{-} \\ + Na^{+} \end{array} \\ \text{NaOH} \rightleftharpoons & & \end{array}$$

$$\downarrow$$

$$\text{Cocaine} + H_2O$$

In summary of this part of the discussion we might say that in general the salts of organic bases are incompatible with soluble inorganic bases and the salts of organic acids are

incompatible with soluble inorganic acids, since in both cases the salts may be converted to the slightly soluble free acids or bases. Furthermore, all organic acids or bases may be assumed to be water insoluble and exceptions learned as necessary, the rule of similarity in chemical structure being perhaps the best guide for the anticipation of solubility in water.

In conclusion the author wishes to reiterate that this is a method of teaching which he has found to be useful in the course stated. No claim is made for the originality of the ideas presented; they have been gathered from many sources. Only an outline has been presented here and it may be enlarged upon or altered to suit the wishes of whoever may adopt it. The only justification which we have for presenting the material is that it gives the student an opportunity to organize in his own mind some of the facts which are most important regarding the incompatibilities of organic compounds. It gives him a framework upon which he can build and relieves him of the necessity of memorizing innumerable seemingly unrelated facts and figures.

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Notes on Preparation of Isotonic and pH Adjusted Collyria*

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It has been and to a large degree still is, common practice to manufacture ophthalmic solutions by the simple expedient of dissolving the prescribed therapeutic agents in distilled

*This paper was prepared for use in the drug stores in Montana and distributed at the 1943 state association meeting. It will interest teachers of dispensing pharmacy.—Editor.

water, or at best, in normal saline solution. This almost inevitably results in the preparation of a solution that is irritating to the delicate corneal tissues of the eyes. The degree of irritation may range from a mild sting in the case of boric acid, to an intense burning sensation as experienced with zinc sulfate solutions.

The disadvantages of such an irritant collyrium are twofold. First, the painful burning sensations are very disconcerting to the patient, but more important is the relative therapeutic ineffectiveness of such a preparation. An irritant solution will produce almost instantaneous lacrimation when placed in the eye and thus wash the medicinal agents from the sphere of their therapeutic action before their beneficial effect can be realized.

Recently in the light of developments in ophthalmology, a new trend has been introduced in the preparation of ophthalmic solutions. This trend has been directed toward the elimination of the irritant properties from ophthalmic preparations by making certain adjustments which result in a finished product that more closely simulates the lacrimal fluid. The adjustment of the osmotic pressure, or in other words, rendering the solution isotonic with the tear secretions, will correct to a large extent the irritant properties of the liquid preparation that is instilled into the eyes.

If a solution applied to one side of a membrane, such as is found in the eye, has the same concentration of molecules and ions as the tissue fluids found on the other side of the membrane, then the osmotic pressures of the two liquids are essentially equal—or it is said that the solutions are isotonic. If a solution has a lower effective concentration of dissolved material than the tissue fluid, then it is said to be hypotonic. If the concentration of ingredients is greater than the concentration of substances found in the tissue, that is, if the osmotic pressure is higher, then the solution is hypertonic.

The irritant properties of a non-isotonic solution can be readily understood by examination of the physical processes that take place in the tissues of the eye during the establishment of osmotic equilibrium between either a hypotonic or hypertonic solution, the lacrimal fluid and the tissue fluids. If a hypotonic solution is applied to the eyes, the tissue fluids will absorb water from this unadjusted solution and thus

cause the delicate corneal tissues to become engorged with fluid. This stretching of the tissue cells results in painful reactions, the severity of which depends on the extent of the hypotonicity, i. e., the irritation produced by distilled water is more intense than that produced by a partially adjusted solution. If the collyrium is hypertonic the solution will withdraw water from the tissue fluids until the concentration of solute in the two solutions is essentially equal, and osmotic equilibrium has been established between the added solution and the tissue fluids. This withdrawal of water from the tissues causes a dehydration and shriveling of the tissues which also produces painful reflexes.

It can be readily seen from these facts that an isotonic solution is much more efficient and desirable in the treatment of ophthalmic disorders than one whose osmotic pressure must be readjusted by the absorption of water from the tissue fluids as is the case with a hypertonic solution, or by the loss of water to the tissue fluids as occurs with hypotonic solutions.

Several formulas are available for calculation of the amounts of medicaments required to make solutions isotonic. While they are based on the knowledge that a 1.4 per cent solution of sodium chloride (6.356 grains per fluid ounce) is isotonic with the lacrimal secretion, certain other figures or constants must be used that are not often readily available to the dispensing pharmacist.

To overcome this difficulty and to simplify the calculations, a table has been arranged and published by Mellen and Seltzer.[1] In this table of substances most frequently employed in collyria, which follows, the values were determined by an acceptable method.

This table of tonicic equivalents consists of three columns:

1. The concentration per cent of the substance necessary to produce a solution isotonic with the lacrimal secretion. Col. I.
2. The number of grains per ounce accomplishing this concentration. Col. II.
3. The sodium chloride tonicic equivalents of one grain of each substance. Col. III.

1. Mellen and Seltzer, *J. Am. Pharm. Assn.*, 25 (1936) 759.

They state "a solution is, respectively, hypotonic, isotonic, or hypertonic with the lacrimal secretion, if and when the sum of the sodium chloride tonicic equivalents, given in column III, of the substances entering into the solution is less, equal to, or more than 6.356. Only in the case that this sum is less can adjustment be made to render it isotonic.

To Use the Table

"With the formula of the prescription written per fl. oz., add the sodium chloride tonicic equivalents of the ingredients, subtract the total from 6.356 and the remainder represents the amount of sodium chloride per fluid ounce to be added to render the solution isotonic.

"Examples (using Table I):

No. 1

℞

Zinc Sulphate	gr. I
Boric Acid	gr. X
Aqua Dest. *q.s. ad*	fl. oz. I

M Isotonic solution

1 fl. oz. isotonic solution NaCl contains		6.356	gr. NaCl
Tonicic equivalent of 1 gr. $ZnSO_4$	0.1696 gr. NaCl		
Tonicic equivalent of 10 gr. H_3BO_3 (10 x 0.525)	5.25 gr. NaCl		
Total equivalents of ingredients in ℞		5.4196	gr. NaCl
To make solution isotonic add		.94	gr. NaCl

No. 2

℞

Atropine Sulphate	gr. V
Aqua Dest. *q.s.ad*	fl. oz. ss

½ fl. oz. isotonic solution NaCl contains ½ x 6.356 or	3.178	gr. NaCl
Tonicic equivalent of 5 gr. atropine sulphate is 5 x 0.0935 or	0.4675	gr. NaCl
To make solution isotonic add	2.7105	gr. NaCl

TABLE I. TONICIC EQUIVALENTS

Name	Table of Concentration, %	Concentration Grain per oz.	Sodium Chloride Tonicic Equivalent of 1 Grain
Sodium Chloride	1.4	6.356	1.0000
Ammonium Chloride	1.5362	6.974	0.9113
Alum (Ammonium)	7.8103	35.459	0.1792
Antipyrine	8.1045	36.794	0.1727
Atropine Sulphate	14.959	67.914	0.0935
Borax	16.4424	74.648	0.0851
Boric Acid	2.667	12.108	0.525
Chloretone	7.6432	34.700	0.1831
Cocaine HCl	9.7548	44.287	0.1435
Dionin	11.0773	50.291	0.1264
Ephedrine HCl	5.79	26.287	0.2418
Ephedrin Sulphate	9.2257	41.885	0.1517
Eserine Salicylate	17.803	80.826	0.0796
Eserine Sulphate	13.9678	63.414	0.1002
Homatropine HBr	10.227	46.43	0.1364
Hyoscine HBr	12.5833	57.128	0.1113
Hyoscine HCl	10.7886	48.98	0.1298
Morphine HCl	10.7893	48.983	0.1297
Morphine Sulphate	16.3375	74.172	0.0856
Pilocarpine HCl	7.0253	31.895	0.1993
Pilocarpine Nitrate	7.7876	35.356	0.1797
Sodium Bicarbonate	3.618	16.426	0.387
Tannic Acid	13.8750	62.993	0.1009
Zinc Sulphate	8.256	37.482	0.1696

"Another feature of the table is that the pharmacist will recognize immediately whether the collyrium is hypertonic or hypotonic. If, for example, it contains 15 grains of boric acid per fluid ounce, a glance at the second column of figures will show that it is hypertonic.

"A further suggestion for ready dispensing, if the quantity of prescriptions warrants it, is to have on hand isotonic solutions of single ingredients commonly prescribed such as zinc sulfate, boric acid, sodium chloride, etc., using the quantities specified in the second column of figures in the table. Then in dispensing, it is only necessary to measure the volume of the isotonic solution of each chemical named representing the number of grains of each required and then add isotonic solution of sodium chloride sufficient to bring to the volume specified.

"The solutions prepared in this manner are for all required

purposes isotonic. With the table before him, the pharmacist finds the method simple, quick and readily applied at the dispensing counter. This use of the table eliminates all the burdensome work of calculation which has heretofore been necessary. The patient using these collyria is relieved of the discomfort attending the instillation of a solution of unnatural osmotic pressure, and the physicians who have been supplied with collyria thus adjusted have found them indispensable."

Adjustment of pH in Ophthalmic Prescriptions

In addition to adjusting the tonus of an ophthalmic solution, the acid or alkaline reaction, termed the pH of the solution, must also be adjusted within narrow limits to that of the lacrimal fluid if a completely non-irritating and effective collyrium is to be prepared.

The term pH 7 indicates a neutral solution, a pH of less than seven signifies an acid solution while a preparation having a pH of more than seven is alkaline.

The pH of normal lacrimal fluid is commonly accepted to be about 7.4; however, a solution that is within the pH range of 6.5 to 7.8 is relatively non-irritating, provided that the collyrium is also isotonic with the tears. This range allows the adjustment of the acidity or alkalinity of the solution to the condition at which the effectiveness of the drug is manifest to the highest degree. Thus atropine, homatropine, physostigmine and pilocarpine are more effective in slightly alkaline solution (pH 7.6) than in slightly acid solution. On the other hand, zinc salts will precipitate in the tear secretion unless the medium is as acid as pH 6.0. Collyria adjusted within the range of pH 6.6 to 7.8 may be used with the greatest comfort by the patient provided the pH of the tear secretion is approximately normal before the solution is instilled.

The pH of collyria may be adjusted by use of buffer solutions which provide and maintain the pH which is desired. If the solutions were not buffered the addition of the drug might cause a marked change in the pH of the solution. Formulas are available for the preparation of a stock buffer solution which is alkaline in reaction and for another which is acid in reaction. By mixing these two stock solutions in certain proportions, solutions of various intermediate pH values may be prepared.

Gifford's Buffer Solutions

Gifford[2] has developed an acid buffer solution which contains boric acid because of its preservative qualities and potassium chloride as a neutral salt for which certain synergistic properties have been claimed. The formula is as follows:

Gifford's Acid Buffer Solution (No. 1).

Boric acid	12.4 Gm.
Potassium chloride	7.4 Gm.
Distilled water	1000.0 cc.

This solution has a pH of 5.0.

A stock alkaline solution is prepared according to the following formula:

Gifford's Stock Solution of Sodium Carbonate.

Sodium carbonate (anhydrous)	21.2 Gm.
Distilled water	1000.0 cc.

Solutions of various pH values may be prepared by mixing the stock solutions in the following proportions:

TABLE II

Acid Buffer Solution (No. 1)	Stock Solution of Sodium Carbonate	pH of Mixture
30 cc.	0. cc.	5.0
30 cc.	0.05 cc.	6.0
30 cc.	0.1 cc.	6.2
30 cc.	0.25 cc.	6.75
30 cc.	0.55 cc.	6.95
30 cc.	1.00 cc.	7.2
30 cc.	1.50 cc.	7.6
30 cc.	2.00 cc.	7.8
30 cc.	3.00 cc.	8.2
30 cc.	4.00 cc.	8.4
30 cc.	8.00 cc.	9.0

As indicated in the preceding table, a solution of pH 7.6 may be prepared by mixing 30 cc. of acid buffer solution (No. 1) with 1.5 cc. of the stock solution of sodium carbonate. To insure accuracy in mixing small quantities, it is necessary to have burettes or measuring pipettes graduated in tenths of a cc. In general, errors of measurement will be reduced if

2. Gifford, S. R., *Arch. Ophthalmology*, 70 (1935), 78.

larger quantities of the solutions are measured and mixed. To insure accuracy, it is necessary to use distilled water and pure chemicals, and to weigh the chemicals accurately in preparing the stock solutions. The use of clean glassware is essential. If these precautions are followed, the pH of the resulting solutions should be sufficiently accurate for practical purposes.

The range of pH covered in Table II includes solutions as acid and as alkaline as can be well tolerated by the conjunctiva and cornea. In deciding which of these solutions will be of advantage in certain cases, the solubilities of the drugs must be considered as well as the object to be attained in using buffer solutions. The object is the maintenance of the drug at the reaction least irritating to the eye and most compatible with its local effect and absorption during prolonged use.

The acid buffer solution (No. 1) having a pH of 5.0 is suitable for phenacaine.

A solution of pH 6.0 is a suitable vehicle for zinc salts, cocaine and epinephrine.

A solution of pH 7.6 is suitable for atropine, homatropine, pilocarpine and physostigmine. These alkaloids are best absorbed and least irritating in this slightly alkaline solution. Marked idiosyncrasies are not affected by use of this medium but certain milder reactions, such as occur with physostigmine and pilocarpine, are less apt to occur when this slightly alkaline solution is employed. Physostigmine salts in this solution turn dark red almost immediately but the potency of such red solutions is not inferior to that of colorless solutions. The solution of pH 7.6 is also suitable for use as a simple eyewash and as a substitute for tears in mild epithelial dystrophy and some types of chronic conjunctivitis and may be used by patients wearing contact lenses to facilitate insertion and reduce irritation.

A solution of pH 8.4 is used in certain conditions such as vernal conjunctivitis. A three per cent solution of sodium bicarbonate has a pH of 8.4 and may be used in place of the solution prepared by mixing the stock solutions if desired.

A solution of pH 9.0 is used to dissolve sodium fluorescein.

In conditions causing acidity in the eyes, the physician is

likely to prescribe an alkaline eye wash. Corneal injuries and other eye trouble leading to alkalinity in the eye are usually treated with an eye wash which is slightly acid. When there is no indication for a special pH because of eye conditions or drugs used, an eye wash of pH 7.4 or 7.6 may be employed.

Feldman's Buffer Solutions

Feldman[3] has advocated the use of collyria buffered by means of boric acid and sodium borate, and containing sodium chloride as a neutral salt.

Feldman's Acid Buffer Solution

Boric acid	12.368	Gm.
Sodium chloride	2.925	Gm.
Distilled water q.s.	1000.0	cc.

Feldman's Alkaline Buffer Solution

Sodium borate	19.07	Gm.
Distilled water q.s.	1000.0	cc.

Solutions of various pH values may be prepared by mixing the stock solutions in the following proportions:

TABLE III

Acid Buffer Solution	Alkaline Buffer Solution	pH of Mixture
100.0	0	5.0
100.0	0.4	6.0
30.0	3.0	7.35
30.0	5.0	7.6
30.0	24.0	8.4
2.0	30.0	9.0

3. Feldman, J. B., *Arch. Ophthalmology*, 17 (1937) 796.

The new and enlarged Danish Pharmaceutical Institute, which had been started before the Nazis invaded Denmark, has finally been completed and dedicated on November 2, 1943, in Copenhagen. It is under the direction of Prof. Carl Faurholt, who had to postpone on account of the war, a planned visit to leading pharmaceutical teaching institutions of this country.

The Future of Pharmacy*

HENRY M. BURLAGE

School of Pharmacy, University of North Carolina

It is difficult for one person to discuss the future of pharmacy in the time allotted because there are so many problems and challenges which need the collective and serious thought of those engaged in all branches of professional work.

Foremost of these problems is socialized medicine. This may be with us before or soon after the present war is over. If this occurs, American pharmacy like that of Great Britain will be greatly concerned. What will be the status of pharmacy in this type of social reform in which everyone will receive medical care free or at a reduced cost? This will, no doubt, have a decided effect upon the sale of proprietary products. Whether it will mean more prescriptions and less dispensing by the physicians or the exact opposite, only the future can tell. Will drugs then be dispensed through retail stores, or dispensaries controlled by the government, or through hospitals? If through hospitals, it may be done by nurses or one pharmacist might be expected to fill the prescriptions which had been distributed by ten or more stores formerly. If dispensaries are to be governmentally controlled, does it mean that there will be two kinds of pharmacies with our present retail store losing many or all of its professional privileges? Is pharmacy to allow itself to be left out of this medical program as it was in the one proposed in 1938-9?

Such questions have received but little attention in recent years at the pharmaceutical meetings the speaker has attended. There are many more which must be considered before pharmacy is assured of its position in such a plan.

Under a federal medical program it is quite likely that the profit motive will be removed from the production of medicines and this might mean a greater need for the establishment and development of research programs in schools of pharmacy and even pharmacies, rather than in manufacturing concerns. Plans for the support of such projects will need to be formulated with the help of pharmacists.

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*One of a series of papers presented in a symposium on "Pharmacy in Wartime" before the North Carolina State Pharmaceutical Association, May 19, 1943.

If pharmacy is not to be greatly affected by a medical program, its plans should be definitely directed toward the maintenance and improvement of our present educational and professional standards and be on the guard against any efforts by a meagerly trained military personnel to receive recognition after their release from the armed forces.

Hospital pharmacies will continue to increase in number if the efforts of the newly formed body of hospital pharmacists are properly directed and supported by all pharmacists. If this is done, legislation will be proposed to prevent the present practices in some hospitals, where pharmaceutical tasks are performed by untrained persons. The rate of increase in the number of strictly professional pharmacies will depend upon pharmacy's position in a federal medical program. Better working conditions and compensation must be a part of the future program if we are to reduce the losses now being experienced in our best trained personnel and to keep our professional personnel from becoming affiliated with trade unions as has already occurred in some of our larger cities.

Pharmaceutical organizations should, and will, become more representative in memberships by lending support to *all* registered pharmacists and not continue to operate primarily for the benefit of the proprietors. The non-proprietor registered pharmacist is the "forgotten man" in pharmacy. It might be well for our existing organizations to give him more consideration or the profession might be forced to accept trade unions or other new associations of a similar nature.

In our plans we must take into consideration the ever-increasing number of women pharmacists who, at present, constitute a considerable portion of our superior students. Their services must not be considered less valuable than that of men simply because they are women. A knowledge of labor laws relative to employment of women will be necessary.

Retail pharmacy must pay greater attention to public health and its problems; it must reclaim lost profitable sidelines that were originally pharmaceutical and eliminate many of the questionable and highly competitive items which detract so much from professional practice.

Retail pharmacy must resort to a greater interest in manufacturing pharmacy than has been apparent in the past thir-

ty or more years. There should be an increase in this type of pharmacy rather than a decrease. This will involve a greater knowledge of the methods of preparation of medicaments for perenteral use, the manufacture of tablets with machines, and of ointments, lotions, and suspensions with homogenizers. The tendency will continue to be toward the administration of the simples and this will mean the development of improved methods of medication of them. The retail pharmacist should apply some of his skills to this type of manufacture on a semi-commercial scale and acquire some of the rather inexpensive machinery that is available for these purposes.

If the present conflict continues for some time, there will be a shortage of commonplace critical materials. Pharmacy should, and will continue to serve the public by preparing forms of medication which will be suitable substitutes for what is not available. English pharmacists have been doing this to a great degree. The Pharmacopœia and the National Formulary have recognized some of these shortages in recently issued annoncements. This situation will become worse and will continue beyond the duration.

Is pharmacy to continue to lose the enviable position that it has held in the past insofar as the public is concerned? Its position has been aptly described by a dean when he estimated that the population of this country passes through the doors of a pharmacy every week of the year. What is the effect upon this position by the adverse publicity broadcast by radio humorists, some of whom are even paid by pharmaceutical interests, and by items issued by an uninformed press? Will pharmacy continue to ignore the importance of the proper type of publicity? Will it support a much-needed long range program designed to present pharmacy in the right light?

Finally, is pharmacy going to continue to permit the proprietorship of a significant number of its vital outlets to be in the hands of persons who are not pharmacists and who are interested in pharmacy primarily from the commercial viewpoint?

Worthy of pharmacy's consideration are these two quotations from the writings of that wise American, Oliver Wendell Holmes: "There is a short rule for obtaining the confidence

of your community—i. e. DESERVE IT" and—"I find the great thing in this world is not so much where we stand, as in what direction we are going."

A Preparatory Course in X-ray Technic

DONALD C. BRODIE

School of Pharmacy, Purdue University

The curricula of most professional schools and colleges usually contains one or two courses which are somewhat unusual insofar as the accepted curriculum for the particular profession is concerned. These courses frequently have been designed by someone with more than average foresight, and someone who has been both willing and able to devote time and study in addition to the assigned teaching duties in order to achieve certain objectives which he has visualized. The Purdue University School of Pharmacy has as one of its unusual courses one designated as "Preparatory Course in X-ray Technic." Due to the fact that such a course is unique in pharmacy schools, it was believed that others interested in pharmaceutical education might be interested in some of the history and the manner in which the course is conducted.

In 1931, John Goorley* began an investigation of enteric coatings. After developing a coating which was satisfactory from the point of manufacture and behavior "in vitro," it became necessary to study the behavior of the coated medicaments in the alimentary tract. The only method by which such a study could be made at that time was through the use of fluoroscopic and radiographic methods. Realizing the importance of the pending investigation the sponsors of the research cooperating with the General Electric X-ray Corporation, made possible the installation of an x-ray unit which was entirely adequate both for the project at hand and for any general uses which the School of Pharmacy might have. The investigation of the passage of capsules, coated with the Goorley formula through the digestive tract was begun immediately with 132 individuals acting as subjects for the study.

*Goorley, John, A Study of Enteric Coatings, J. Amer. Phar. Assoc., 27, 379-384 (1938).

The preliminary study in each case was carried out with the fluoroscope and a final record was made by radiography.

In September 1933, a special investigation as to the incidence of tuberculosis among the incoming freshmen students and junior military camp candidates of the University was undertaken through the combined efforts of the Student Health Service of the University and the Tippecanoe County Tuberculosis Association. The von Pirquet skin test was applied to 1054 students, 571 of whom returned for a reading of the result. Of this group of 571 students, 123 were reactors, 95 of whom showed a two-plus or stronger reaction. Those students who were reactors were requested to submit to x-ray examination. The x-ray work for this investigation was planned originally to be done at the Ross Sanatorium, but because of the greater convenience, Dr. W. H. Mytinger, in charge of the investigators requested that the mechanical part of the radiographic work be done by the School of Pharmacy. According to the report, the results of the study were as follows: Eighty-three students reported for the radiological examination and of these, two cases showed moderately advanced tuberculosis, six cases were classed as suspicious and were put under observation, thirty-six showed definite signs of calcification, and thirty-nine were classed as normal. Among the students who returned for a reading of the skin test, the incidence of infection was found to be 21.54 per cent.

The School of Pharmacy participated in a similar program in the fall of 1934, at which time members of the freshman class and the junior military camp candidates were again surveyed.

These tuberculosis surveys marked the beginning of routine radiographic chest examination of incoming students at Purdue. The School of Pharmacy has continued to cooperate with the Student Health Service of the University in its campaign against tuberculosis. As a result of the project approximately 5,000 chest radiographs have been taken since the inception of the work in the fall of 1934. It must be clearly understood that from the beginning the part taken by the School of Pharmacy has been the execution of the mechanical procedures necessary for the taking and processing of the radiographs. Each week the completed work is sent to the Ross Sanatorium where radiographs are interpreted and the diagnosis made. Questionable cases are rechecked and where seri-

ous pathology exists the students are dismissed from the University for proper medical attention and treatment. The tuberculosis program of the Student Health Service is one of the chief contributions of this organization to the University and the School of Pharmacy has been fortunate in having this means of serving the health needs of the University.

After showing an interest in this type of work, the School of Pharmacy was asked to design a course in clinical x-ray technic which might be offered to students studying for careers as hospital pharmacists or medical technologists. The organization and administration of this work was undertaken and completed by Dr. Carl J. Klemme. As a course of this type was so new, a test course was given in 1933 in which students received no academic credit, but were sufficiently interested to accept the work for whatever benefits they might obtain. The original group consisted of eight students selected from the School of Science. The work was so outlined that the students worked in pairs and in this arrangement one student acted as the patient while the other did the actual manipulative work. The results of the experiment were highly successful in the eyes of those who were closely watching the progress of the project and plans were worked out for introducing a course in x-ray technic into the curriculum of the University, beginning September 1934. Since that date class instruction has been given at least once each academic year, and on several occasions an intensive course of five weeks' duration was given in the summer session which was attended by nurses, technicians, and college seniors from various parts of the country.

In the past only women students were encouraged to enroll for the course, and then the enrollment was limited to 12 students, admittance being granted only after a satisfactory interview. In view of the changing events in the national life, this policy has been changed in order to meet the present day needs. In the term which ended in December 1942, two laboratory groups were held each week, one group for men and one for women. These groups met on different afternoons for a three-hour period of actual x-ray practice, and once a week for a one-hour lecture. The change in policy was made so that men as well as women might receive this instruction. The value of men with the armed forces is enhanced and the shortage of women with x-ray training is relieved by this program.

The course is open only to those students who have shown a special aptitude for manipulative work. The entire course is devoted only to the act of producing diagnostic radiographs and at no time does the work border on the field of therapy and diagnosis. The place of the x-ray technician in the field of medicine is very similar to that of the pharmacist. Each is a servant to humanity but each must realize the limitations of his own field. This part of the student-technician's training is most important and special emphasis is placed on the professional status which he must maintain in order that he does not encroach on the professional rights and privileges of the diagnosing physician by offering interpretive comment. It is only when the x-ray technician fully realizes his place in the realm of medical practice that he is able to completely fulfill his obligation to the profession which he serves.

A 24 MONTH ACCELERATED PROGRAM INADEQUATE

In a letter to General Hershey dated August 2, 1943, President W. C. Coffey of the University of Minnesota made the following statement: "I understand that the changes made by the War Manpower Commission and the Selective Service System in the conditions governing the eligibility of pharmacy students for occupational deferment as stated in Activity and Occupation Bulletin No. 33-6, issued March 1, 1943, and amended June 17, 1943, and July 1, 1943, have given rise to widespread proposals that colleges of pharmacy admit students under a program that will accelerate the course of instruction to a total of not more than 24 months.

I have talked at length with the Dean of the School of Pharmacy here and with various other persons on this matter, and I conclude that such a program in the field of pharmacy education is inadequate and that its results would be unsatisfactory. Therefore, we of the University of Minnesota are not disposed to attempt a program on a 24 months' basis.

The problem still remains of insuring an adequate flow of trained pharmacists, since the normal and necessary number of students will not, in view of the 24-month regulation, be able to complete their courses."

"The 24 months plan is not attractive to prospective students. Eventually it may lead to a demand for the old two year curricula. With the exception of private colleges of pharmacy, before the close of the next school year I predict that the 24 months course will be found to be impractical, that the mortality of students will be heavy and many colleges of pharmacy, including our own, may be discontinued." —A. Ziefle.

Editorials

The Accelerated Program

Since Pearl Harbor, the tempo of living has increased drastically to meet the needs of the nation in this total war. The full use of time in industry and the training of men for the specialized armed services has become increasingly important. In keeping with this demand, education has undergone profound changes which penetrate the university, college and even the high school. Accelerated programs have become the keynote in the vast effort to supply both the armed forces and the civilian population with professional and other specially trained men and women in order that the conduct of the conflict and life on the home front can be carried on to the best advantage.

The University of Iowa adopted the intensified program of study on May 11, 1942. This course was determined when the Navy decided to establish on the campus a pre-flight training school and the Army a pre-meteorological school. These programs have expanded to other fields so that, at present, a large proportion of the University's facilities are being used for the training of specialized personnel.

The College of Pharmacy has completed three terms of sixteen weeks each on the intensified program. Neither the quality nor quantity of the work in course has been curtailed. In spite of the fact that the demands on the students are greater, there has been complete cooperation in accepting the added responsibilities. When the accelerated program was adopted, 96 per cent of the students then in attendance elected to pursue it and this enviable spirit has prevailed since.

Contrary to what might have been predicted, the scholastic achievements of the students have not been jeopardized by this program. Analysis of the grade point averages for the term ending April 24 shows that the average for all students registered was slightly above normal. This indicates that the average ability of those students now attending is greater or that they are applying themselves more diligently because of the necessity of greater progress.

Despite the accomplishments of the accelerated program, it is desirable only as a defense measure. Much is lost in the opportunity for social and cultural development, the opportunity to deliberate on subject matter and in mental and physical rest so necessary in and for a rounded education. It is hoped that the day is not too far distant when a more leisurely and thorough type of education can be returned to.

James W. Jones,
State University of Iowa.

Acceleration and Its Effects on Education

We are now in our fourth period under the acceleration program because of the war, but we are not far enough along to warrant any definite conclusions as to the ultimate good or bad effects on pharmaceutical education. Nevertheless, there are indications that such sustained effort will eventually bring about certain situations which we fear will decrease the efficiency of our educational program, and the accelerated program will not be up to the standard of our normal program.

The effort required from the student is not greatly increased over the normal program in relation to the courses. The hardship on the student is the absence of holidays, vacation periods. The student is slightly inconvenienced in being required to hand in assignments on shorter notice with less time available for preparation. The extra time given by professors to students in laboratories is no longer possible and the absence of these extra contacts are losses to students.

Instructional staffs are hard pressed in many ways. The absence of time for study, research and constructive program of reading and thinking will begin to show its effects in the near future. Yes! we know these are days of war.

Abraham Flexner's autobiography entitled "I remember" should be a *must* reading for every educator in Pharmacy. It is a remarkable story of the progress of medical education in the United States. It is very illuminating. Once more the silent variety of gratitude is paid to Pharmacy. The money used to send Abraham Flexner to Johns Hopkins he grate-

fully acknowledges came from his brother's pharmacy. It was his early association and contacts with the Johns Hopkins faculty which later promoted him to a position where he could do so much for American medical education. Are we ready for this kind of a program in Pharmacy? Do we need it?

Edward J. Ireland,
Loyola University, New Orleans.

TO THE CLASS OF 1943

Because 1943 has witnessed the coming of the Army Specialized Training Program to our campus, your class will be known as a war class. We pray that the next class may be known as of the year of peace.

We live in the present, we dream of the future, but we learn eternal truths from the past. In the pages of history we read of so-called religious wars. If there ever was a holy war it is the current one, because the Axis fiends have shown that they are literally anti-Christ. The concepts most dear to us are freedom, justice, and the dignity of the individual. These are fundamental concepts of Christianity. The Axis powers boast that they have no respect for anything but brute force, and they hold that conquered peoples should become slaves. But it is axiomatic that the highest kind of government is maintained through self-discipline.

The teachings of Christ radiate ideas for the elevation of souls and intellectual capacities far above the common passions of hate and degradation. It is still true that the essential law is the law of love found in the two great commandments—Thou shalt love the Lord, thy God, and Thou shalt love thy neighbor as thyself. At bottom, both the philosophy and the strategy of Hitlerism are based on thoroughgoing contempt for the human soul. It is possible to rid the world of Hitler by the employment of military force alone; but we can never eliminate the greater danger, Hitlerism, without a spiritual dynamic grounded in a realistic faith in the powers of the human spirit.

We have been taught to believe that the powers of the soul are equal to its needs; and that courage is contagious. Religion is the ultimate source of realistic courage because it reveals us to ourselves as human beings possessing the means of renewing our spiritual strength. Unless we manage to add to our inner resources, our very lives will be consumed. Religion enables us to build up our spiritual reserve power. The familiar words of the Psalmist are psychologically and spiritually true: "They that wait upon the Lord shall renew their strength."

The University of Nebraska
May 24, 1943.

C. S. Boucher,
Chancellor.

The Editor's Page

These are great days for pharmacy. Within the year three important events have taken place which bode well for its future. The first one was the establishment of the American Foundation for Pharmaceutical Education, which means that men in every phase of pharmaceutical endeavor realize they have an obligation to support and encourage pharmaceutical education and research in a substantial way. The second event of note was the passage of the bill for the establishment of a Pharmaceutical Corps in the Army, which means the recognition by Congress and by the citizens of this country through their representatives in Congress, the need of a better pharmaceutical service in the Army, to say nothing of the fact that it means justice to the profession of pharmacy. The third and last outstanding event of the year is the granting of deferment to pharmacy students by the War Manpower Commission on the basis of a twenty-four months accelerated program. This is recognition by the Commission that pharmacy is a necessary profession and that it is necessary to keep a stream of pharmacy students flowing through our colleges in order that the civilians may have the best qualified service obtainable under war conditions. That recognition is a forward step in the struggle of pharmacy for recognition as a necessary health profession by the War Manpower Commission. It has seemed to one at a distance, that the attitude of the War Manpower Commission toward pharmacy has never been too complimentary. This may have been due to the fact that the case of pharmacy had never been presented in sufficient detail and clarity to the medical and lay officers of the Army, Navy, the Public Health Service, the Selective Service and other governmental agencies and the War Manpower Commission itself, to convince them of the service which pharmacy does and can give. I have been amazed at the attitude of the intelligent men in other scientific fields, who do not appreciate the service which the pharmacist renders. For this they can scarcely be criticized because a layman is in no position to judge the service which a pharmacist renders by any other criterian than the appearance of his store and when the pharmacist places the merchandising feature of his store forward rather than its professional function, he destroys all of the claims it possesses for recognition as a public health agen-

cy. The War Manpower Commission sometime ago asked the Medical and Health Supplies Section of the Office of Civilian Requirements of the War Production Board, of which section Dr. Robert P. Fischelis is chief, to make a study and prepare a report which might be used as a basis to create a policy for the deferment of pharmacy students. The United States Public Health Service cooperated in the preparation of the report. With Dr. Fischelis directing the preparation of the report we can be assured of its accuracy and clarity and it was upon the facts so presented, that the War Manpower Commission made and submitted its plan of a twenty-four months accredited program. Again we commend the Chief of the Medical and Health Supplies Section, for a job well done and a real contribution to pharmaceutical education and pharmaceutical practice.

On the twelfth of July in Baltimore, the American Council on Pharmaceutical Education met and revised its standards so as to meet the twenty-four months accelerated program granted by the War Manpower Commission (see Miscellaneous Items of Interest). The Council has made it clear that the adoption of the twenty-four months program is optional. It is a question for each institution to decide. No one can claim that the twenty-four months program is a sound educational policy, neither is a thirty-six months accelerated program a sound educational policy, that has been in effect long enough so we have the answer. Medical students and dental students and pharmacy students and their faculties have already gone stale, but it is a war measure. Since that program was adopted, laws have been changed in many states to permit registration for graduates of such courses. It is possible that legislatures will again amend the pharmacy laws to make it possible for graduates of the twenty-four months accelerated courses to practice. In the former request we were acting jointly with the medical and dental men in our respective states. This time we will be standing and asking alone. It is not a comfortable position to be in. Schools not associated with great universities will have less of a problem in adopting the twenty-four months program. In the university schools, if the plan is adopted, it will mean the granting

of a bachelor's degree on a lower basis in pharmacy than in any other unit of the university. It will classify pharmacy on a lower level than any other college, academic or professional. In some states the licensing of a graduate from a twenty-four months course would require legislative action. In some cases the earliest date at which this could be done is 1945 without a special session of the legislature and this would be unlikely. There is a question whether graduates of such a course would be eligible for enlistment in the Pharmaceutical Corps of the Army or other governmental positions without lowering the present standards. It is impossible to adopt a twenty-four months program and include 3200 hours of the required work of the Syllabus without introducing cram methods into our curricula and such methods are as destructive educationally in the time of war as they are in the time of peace. It may be the salvation of our present program if some institutions find it impossible to go to a twenty-four months program even at the cost of the loss of the major part of the student body. Such institutions may offer their regular courses and any special courses that may be needed ih the winning of the war. In fact, I do not hesitate to say that if the winning of the war requires 90 day courses, such courses could be given better in our teaching institutions with their material, equipment and teaching staffs, than they can possibly be given in the various branches of the service where they are now being given. In fact, no institution need to feel it is not patriotic if it does not go into any type of accelerated teaching. In a "long range" program it might be more patriotic not to do so. We must not be carried away by a slogan or by the assurance that what is being done is "for the duration" or as a "war emergency, only." This applies to other things than pharmacy. A lot of things are being done now under the excuse of an emergency that will not end after the duration and we have reached a point in our living where anything is subject to "an executive order." Nevertheless, this is not the time to turn down the lamps. This is the time to light the candle and it is the time to do our own thinking.

In this issue we print the announcement of the passage of the Pharmacy Corps Bill as a matter of record. The story

climaxed by the passage of this covers in time, the best half of a century. We pause here to commend those who through the years have given so unselfishly of their time, talents and money to accomplish the task. In it there is a lesson, one which the American Association of Colleges of Pharmacy may well give thought to, now that pressure is being exerted for the maintenance of a professional lobbyist in Washington. I would rather have one such consecrated soul like Andrew DuMez, or Evert Kendig, or Ernest Little, or Ivor Griffith, or Bernard Christensen, or Hugh Muldoon, or Howard Newton, or Charles Rogers, or Pat Costello, or Rowland Jones, or Evander Kelly, or Wortley Rudd, or Bob Swain, or Bob Fischelis. or Bob Wilson, and a host of others I could mention, go to Washington on a definite task, or get next to a senator when needs be, than to have an army of paid lobbyists twiddling their thumbs down at Washington. And they would get farther, too.

During Dean Rogers' incumbency as president of the Association, he initiated the policy of once a year recording the advances of pharmacy in the pages of the Journal. This has been done under the title "Pharmaceutical Education on the March". This year we thought it proper to add the phrase "in War Time". I do not think, although I have urged it frequently, that either collaborators or deans have given this section the attention it deserves and especially is this true for the current year. They have been timid about stating the true situation because they feel that now we are simply marking time. In fact, as one reads the section one might at first sight think that it might have better been called, "Pharmaceutical Education in Reverse in War Time". But it is not so. The report brings out to an astonishing degree the physical improvements that have been made during the year. More than that, it shows how the colleges have adjusted their programs to war time conditions and the effort that is being made in order to be of service in the winning of the war. Those who have contributed their story to the progress have not told the half that they are doing. For example, in a personal communication to the Editor, Dean Ivor Griffith tells of the difficult financial situation at Philadelphia, a situation which

faces every one of us in one way or another. To meet this situation, Dean Griffith went to his alumni and through their efforts the financial difficulty is relieved at least temporarily, and we know that story will be repeated if the Dean has to go to them again. This is really Philadelphia's great contribution to pharmaceutical education in war time. The war is bringing solidarity to the college and its alumni as it has brought consolidation and solidarity within the body pharmaceutic that made the passage of the Pharmacy Corps Bill a reality.

This circular note came to the Editor's desk as it probably did to many others and it deserves notice here. The note:—"We regret very much to tell you that our recent campaign to obtain additional subscriptions for 'The Science Counselor' was unsuccessful. Consequently, because of lack of adequate financial support and because our staff has been depleted by war, Duquesne University has decided to suspend publication for the duration. There will be no June 1943 issue. Whenever we resume publication we shall be glad to let you know." —Hugh C. Muldoon, Editor.

We regret the suspension of the publication, even for the duration, as much as does Dean Muldoon and Duquesne. In the Science Counselor, Dean Muldoon has made a real contribution to the teaching of science in the high school and incidentally, we take great pride in it because it has been a direct contribution that pharmacy has made to secondary education. This is the kind of publicity that pharmacy needs.

The latest contribution of the American Institute of the History of Pharmacy is a booklet by Dr. George Urdang entitled "A Pictorial Life History of the Apothecary Chemist Carl Wilhelm Scheele". As to the character and value of the work, I shall let a critical historian speak and herewith present a note which Chancellor C. S. Boucher wrote to the author upon receipt of a copy:

Dr. George Urdang,
University of Wisconsin
Madison, Wisconsin

Dear Dr. Urdang:

Dr. R. A. Lyman has delivered to me the autographed copy of your *The Apothecary Chemist Wilhelm Scheele*, which you so graciously sent me via him. I have examined it with keen interest and shall wish to spend some time studying it. The pictures you have reproduced are really all of them very significant historical documents. You have made a magnificent contribution to the history of Pharmacy.

With kindest personal regards,

The University of Nebraska
July 3, 1943.

Yours very truly,
C. S. Boucher, Chancellor

Whenever an announcement comes that an outstanding man has left the college teaching and administrative field for the industrial field there is a distinct sense of loss to his colleagues which is depressing. This is particularly true in the case of Dean Edward D. Davy, who has resigned the deanship at Western Reserve in order to accept a position with the Winthrop Chemical Company. It was a repetition of sensations which we experienced when Dean Edward Spease left the same position to become associated with the office of the National Association of Retail Druggists. However, there is another side to the picture which is inspiring. In both of these instances it transferred from the college to the retail and the manufacturing fields men who are sympathetic with a progressive program of pharmaceutical education. Dean Spease's service to pharmaceutical education has been more helpful than in his former position and we have every reason to believe that history will repeat itself in Dean Davy's new relationship. Pharmaceutical education needs friends in the industrial field, it has them and the number is on the increase. Pharmaceutical education has greater support because Dean Davy has gone into industry.

When Dean J. W. Sturmer retired from active service early in July, it seems to me that no one could say with greater appropriateness than he, "I have fought a good fight, I have kept the faith." Dean Sturmer has had a long and distinguished career as administrator and as an author. Our hope is that his years may be many in which to enjoy the fruits of his labors.

After thirty-three years of service, Homer C. Washburn retired on July 1, from the deanship of the College of Pharmacy of the University of Colorado. Pharmacy in that University had its beginning under Dean Washburn in 1911 and from a beginning as a department it has been developed under his guiding hand into one of the best colleges in the midwest. During the period the Dean has had an outstanding military career also, and because of the fact that he speaks the military language he has been most helpful in obtaining military recognition for pharmacy. Dean Washburn has rendered a great service to his state, his university, and his profession. As he passes from the routine of active duty we shall look forward to profiting by his wisdom and sharing in his enthusiasm for many years to come.

On another page and in Drug Topics, Dr. Robert L. Swain has paid tribute to the friend of all of us, the late J. Leon Lascoff. What Dr. Swain has said so beautifully is what we all would like to say if we had the words to say it. J. Leon Lascoff was the embodiment of all that is best in both professional and civic life. Into his drug store on Lexington Avenue he wove his character, his ambition, and his prayers as the weaver of an oriental rug weaves into it the beauty and aspirations of his soul. When all other men stood on the verge of despair because of the apparently insurmountable obstacles that stood in the way of obtaining our pharmaceutical ideals, from the mountain top came a voice ringing and clear and full of confidence and hope,—the voice of J. Leon Lascoff,—saying, "It can be done." That voice will continue to bring hope and assurance to many generations of pharmacists for many years to come. I am grateful that I was permitted to know J. Leon Lascoff.

Rufus A. Lyman.

"The face that some practitioners have given to pharmacy is not the face that belongs to it. Retail pharmacists must put the practice of pharmacy in all drug stores on a high plane so that pharmacists will stay on a parity with men and women in other public health professions."—Ivor Griffith.

Gleanings from the Editor's Mail

I have your letter of June third asking if you may publish my commencement address in the American Journal of Pharmaceutical Education. Of course you have my permission to publish it. I am glad you think enough of it to do so. Not caring much for titles, I think "A Commencement Address" is proper.

June 5, 1943
Court of Common Pleas, Philadelphia.

Curtis Bok,
President Judge.

From the standpoint of the Pharmacy Library, the April issue of The American Journal of Pharmaceutical Education was well worth waiting for. We have found the material so useful and interesting that we are asking you to send us an extra copy which we will use as one of our library tools. We are enclosing stamps, which we hope will be acceptable.

I hope that future issues of the Journal will contain, from time to time, more material of special interest to libraries.

Mary Hughes Smith, Librarian.
July 15, 1943. Loyola University, New Orleans.

We are pleased to receive the issues of the American Journal of Pharmaceutical Education which you have been sending to the Army Medical Library.

We find that the April 1943 issue of your Journal is especially valuable. If it is possible for you to send us an extra copy of this number we would be grateful for your courtesy.

Thanking you for your attention to this matter, I am

Army Medical Library,
L. K. Falk, Chief,
War Department, Washington D. C. Accessions and Supply Division.
July 15, 1943. For the Librarian.

We shall be very grateful if you can send us a copy of the April 1943 issue of the American Journal of Pharmaceutical Education, which contains the list of pharmaceutical journals. We feel that a second copy of this number will be of great value in our Periodical department.

Archibald Malloch, M. D., Librarian.
July 8, 1943. New York Academy of Medicine.

I am grateful to you for calling my attention to the articles by Howland and Swain in the January 1943 issue of your Journal. I have read both with interest and profit. I found in each, items that I shall wish to quote on appropriate occasions. The reports of your Committee on Libraries for 1941 and 1942 and in the April 1943 issue are impressive.

Thanking you again for your courtesy and thoughtfulness, I remain

C. S. Boucher, Chancellor,
July 7, 1943. University of Nebraska.

Enclosed please find check for two dollars for the 1943 issues of the American Journal of Pharmaceutical Education and accept my apology for not sending it at an earlier date. I have found the Journal to be a very valuable adjunct both in my teaching and, in keeping in touch with what others are thinking and doing pursuant to the growth and improvement of pharmaceutical education.

Last winter I suggested to Dean McCloskey that it might prove fruitful if each of the Teachers Conferences would devote at least one meeting to a careful scrutiny of that part of the Pharmaceutical Syllabus which deals with their particular province. In view of the fact that the Syllabus has recently been revised, it would appear to be a fruitful procedure to have a full and free discussion of it by each of the four Teachers Conferences. This would permit the Syllabus Committee to obtain the reactions and judgments of teachers of the particular subjects as would be possible in no other way. I believe that it would prove to be an especially enriching experience for teachers to hear a discussion of the merits of the inclusion or exclusion of topics in their particular branch of pharmaceutical education. In cultivating, pruning, and extending the pharmaceutical curriculum, we constantly need to bear in mind that we are concerned with the education and training of men and women for a public health profession.

Temple University, Arthur E. James, Secretary,
June 9, 1943. Conference of Teachers of Chemistry.

Our legislature made appropriations for the University at its session last January and it is our plan to continue on an accelerated basis so long as we may have students to teach. I do not believe, however, that it is possible for us to condense our courses into twenty-four months, and I very much doubt the wisdom of doing so. With our accelerated program, we can complete the work in approximately thirty-two months, and we shall continue more or less on this basis with the present information at hand, unless conditions develop at the meeting in Columbia to justify making other changes.

J. Lester Hayman, Dean
July 12, 1943. West Virginia University.

The profession of pharmacy is facing at the present time a perilous situation. Great numbers of pharmacists and students have been taken into the armed forces and many have been diverted to non-professional duties. The responsibility of filling the gaps and vacancies is largely up to the schools and colleges of pharmacy. Regardless of the rulings pertaining to student training in the colleges, our standards must be upheld at all cost. Years have been devoted to the building of a solid curriculum and one which has placed the profession on a high level. If we *must* attempt to do in two current years what was done in four years, it will be necessary to cut the corners somewhere. It is here the danger lies. We can load more work on the student, but he can only do so much. Faculty and administrative problems become complicated and the costs of the institution increase. We must not overlook the fundamentals which have been indispensable during the last decade. Although a new program may be a war-time measure, all schools must sacrifice, if such becomes necessary, only those measures which will not jeopardize the profession.

Forest J. Goodrich, Dean,
July 9, 1943. University of Washington.

All honor to the Regents at Minnesota for naming the building of Pharmacy "Wulling Hall." I seek in no way to detract from this distinction when I say that you are in error on Page 252 of the April *Journal* when you say "This is the first time, as far as I know that the governing board has so honored a distinguished pharmacist in this manner on an American university campus." In 1932 the board of trustees of the University of North Carolina named the building that houses Pharmacy "Howell Hall" in honor of the memory of the late Dean Edward Vernon Howell who died a few months before.

To my mind the act that makes Minnesota outstanding is that it honored Dr. Wulling *while he is still alive.* Ordinarily no college will name a building for any one while that person is living. The reason for this limitation is that almost anyone might commit some act before death of a nature that would exclude such a person's memory from being perpetuated in "stone or marble." The Regents at Minnesota, however, were so positive about the soul and spirit of Dean Wulling that they could in safety disregard the usual custom and pay him high tribute while he could still enjoy the distinction. Had you included the word *living* between *distinguished* and *pharmacist*, I feel certain that no one could question its accuracy. My actual reason for writing is not to quibble over a petty point but to use it as an excuse further to stress the enduring qualities of Dean Wulling's contributions to pharmaceutical educaton not merely in Minnesota alone but everywhere. I immensely enjoy the fact that he so impressed his *own people* that they wanted to pay him homage in an enduring form that he could look upon and enjoy. Here's to you, Dr. Wulling! In words of the late great Joe Jefferson "May you live long and prosper."

University of North Carolina, Affectionately,
July 12, 1943. Grover Beard.

During a recent visit to Hugo Schaefer's office at the Brooklyn College of Pharmacy, I noted a copy of the "American Journal of Pharmaceutical Education" lying on his desk and suddenly realized that it was perhaps one of the few important publications that our office was not receiving. Will you, therefore, please enter our subscription to the Journal starting with the current publication and bill us for same.

American Druggist,
July 14, 1943.

Harold Hutchins,
Executive Editor.

At the Brooklyn College of Pharmacy, as no doubt in every other institution, Acceleration is the keynote. All classes are accelerated; we have no other classes. With the recent request of the Selective Service Board, it appears that our present tempo of acceleration is mild compared with what is expected—namely, completion of the 4 year course in 2 years. Awaiting further notification, we are formulating plans to fall in line.

It is my personal opinion that such acceleration cannot have a very wholesome effect on pharmaceutical education. The material is being fed faster than the possible rate of absorption. Also, this acceleration is rendering the teachers somewhat fatigued and such a condition does not make for satisfactory results.

Berl S. Alstodt,
Brooklyn College of Pharmacy.

July 12, 1943.

How anyone can put 4400 hours into the pharmaceutical curriculum for a course in medical technology is beyond me. I will warrant that pharmacy as such is being neglected and probably indicates just what some of our educators think of pharmacy. On the other hand we have educators who feel that the new Syllabus is too long. I furthermore agree with you that it is high time that pharmaceutical educators come down to earth and try to give a sound undergraduate degree in pharmacy and stop giving a pharmaceutical chemistry course, a hospital pharmacy course, and what not and leave these specialized courses for graduate work or for a special course beyond the B. Sc. in Pharmacy. It is time that we came down to earth and decided to say that what we are offering in the undergraduate and graduate levels is pharmacy and not some other bastard course or let us quit subterfuging and do away with the name *pharmacy* entirely. As I grow older, I am becoming more inclined to call everything but the non-professional basic courses *pharmacy* rather than anything else.

Henry M. Burlage,
The University of North Carolina.

June 6, 1943.

Acceleration was accomplished by introducing a summer term and thus shortening the regular four year course to two years and nine

months. As I see it, the plan has no particular disadvantages. I am speaking now purely in terms of instruction and learning. Neither the instructor nor the student is required to put forth a great deal more effort than usual because the time allotted for the summer term still is of sixteen or seventeen weeks duration.

In our particular situation the circumstances are a little different from those of other schools of pharmacy. Our summer session has caused us no little grief. In chemistry, botany, and other departments of the university, the courses have been so accelerated that a year of chemistry, for instance, is completed in two summer sessions of seven weeks each. This means that certain pharmacy courses must be forgotten until the beginning of the fall session and others must be accelerated in the same manner otherwise there will be constant conflict in each succeeding term. Take for example our situation where a year of pharmacology must be given in two summer sessions of eight weeks each in order to meet the hour requirements. In a five credit hour course this means that at least five two hour lectures must be presented in a week. Now when several courses are being taught simultaneously in this fashion, it seems to me that the teacher will be unable to do justice to his work nor will the student fare especially well, since he will need to assimilate more than double the information required in less than one-half the normal time.

Our situation, of course, is unusual and other colleges may not be similarly effected. In my opinion, this accelerated program is useful for the duration of the war, but should not be continued after the peace has been won. As other voices have already expressed it, teachers need the summer months for recreation, travel or research, while students need the opportunity to gain practical experience and earn money for continuation of their education or for meeting necessary obligations.

MALCOLM S. TRUPP,
Western Reserve University.

July 12, 1943.

I am for a program of high education in pharmacy, for this war, more than anything, has proven to me the wise investment that our young men in pharmacy have found in the four year course, exclusive of its specific pharmaceutical value. I am more than ever happy over the work of those who wisely planned such a course.

I say this because I hope when the war is over we shall return to a dignified compromise with practice in other fields, but certainly introducing leisure for a student as well as hard work and discipline into our course.

IVOR GRIFFITH,
Philadelphia College of Pharmacy
and Science.

July 12, 1943.

Every time the Journal arrives I wish I still had a secretary and good health so that I might dictate the many thoughts and the suggestions that come to my mind when I read the many timely articles and comments in it, but I must content myself with just saying the Journal is a great delight to me.

Sometime soon I will write briefly to Glenn Sonnedecker (p. 254). Deans Washburn's and Crossen's letters make good points.

FREDERICK J. WULLING,
University of Minnesota.

July 20, 1943.

Anent the proposal to go into a super-accelerated program and graduate students in twenty-four months:—I have discussed this matter with President Caldwell, the Dean of Faculties and the Executive Committee of the University Faculty.

The unanimous opinion expressed by them is to the effect that, in their opinion, the proposal is absolutely unsound from an educational point of view, and, that, under no circumstances would they consider granting a B. S. degree on this basis.

It was pointed out that to crowd 3200 hours of work into this time would necessitate an increase of 33⅓ per cent in the load of work now carried by our students:—that this again is educationally unsound and impossible of achievement if quality of work and instruction are to be considered.

Understanding that there is to be a meeting of the Council at an early date, I thought you might be interested in having the reaction of our faculty to this new Super-Accelerated program.

Personally, I feel that it is a dangerous step for us to take, whether we have any students or not, for it would necessarily entail a sacrifice of the standards we have spent years in trying to build up and entirely out of line with the arguments presented to various governmental agencies that pharmacy is now on a professional basis.

It is our plan to continue to operate on the present accelerated basis (unsatisfactory though it is), and we hope to draw at least a sufficient number of students to justify the continuance of our program.

Robert C. Wilson,
University of Georgia.

July 14, 1943

Pharmaceutical Education on the March in War Time

State University of Iowa, College of Pharmacy.—The accelerated program has been in effect since May 1942 and seems to be functioning satisfactorily. Scholarship standards have been maintained and students have been especially cooperative. All students are given the standard Red Cross emergency training and have expressed themselves as highly appreciative of it.—Plans have been completed for rebuilding the main floor of the hospital pharmacy unit in the university hospital. The remodeling will include a new entrance, modern supply and dispensing units and a library room for conferences between physicians and pharmacists. The project was made possible through special appropriation.—Carolyn M. Crabtree, 1943, is employed as a half-time graduate assistant at the hospital pharmacy.

Long Island University, Brooklyn College of Pharmacy.— The consensus of opinion of the members of the faculty is that acceleration does not make for high standards in education. However, in this present emergency, when everything is accelerated, every effort must be made to cooperate and to minimize the evils of acceleration. It is the sincere wish that as soon as the emergency is over, our 4 year course will again be normalized so that the standards of pharmaceutical education may again be able to forge ahead.

Loyola University, College of Pharmacy.— Acceleration is in its fourth period. Conclusions as to its effectiveness cannot be made as yet, but the fear is that acceleration will not result in maintaining high educational standards.—A fifteen weeks course in basic photography has been introduced as one of the pre-induction courses asked for by the Army. There are 65 seudents and 8 auditors. The course consisted of two hours lecture, two hours laboratory and three hours credit.

University of Mississippi, School of Pharmacy.— At the 1942 convention of the Mississippi State Pharmaceutical Association held at Biloxi, a resolution was passed unnanimously providing for the establishment of a corporation which was to be known as the Mississippi State Pharmaceutical Association Student Loan Fund, Inc. The purpose of this corporation is to provide a loan fund for worthy students pursuing a course of study in pharmacy, primarily at the University of Mississippi; to provide scholarships for worthy students at the University of Mississippi; to encourage and interest young men and women of good character and aptitude in the study of pharmacy as a profession; and to equip, aid, or assist in the establishment, growth, or maintenance of a library of pharmacy from corporate funds. P. K. Thomas, Perry Hemphill, D. B. Smith and E. L. Hammond were appointed to apply for a charter of incorporation. During the past year, this has been done, and at the recent one day 1943 convention of the Mississippi State Pharmaceutical Association held at Meridian, an opportunity was given

for the members present to make pledges for the establishment of the loan fund. $1,080 was pledged in the short space of a few minutes and over $600 has been paid in.—During the past year, the university library has acquired a complete set of bound volumes of the American Journal of Pharmacy, beginning with the year 1851.

Montana State University, School of Pharmacy.— Research is being continued in the two and one-half acre drug plant garden. Experimentation is being carried on in the production of strategic drug plants, especially of the solanaceous family. We are particularly concerned with a new plant, hyoscyamus misticus, a relative of our wild species hyoscyamus niger, which grows in abundance in the higher farming altitudes. In addition, those species of insecticidal drugs which belong to the pyrethrum family are being cultivated.

University of Nebraska, College of Pharmacy.— A considerable amount of apparatus has been acquired for research work, including one Bausch & Lomb research microscope and five special research microscopes for graduate students designed for work in cellular physiology; a Bancroft-Warburg respiration apparatus, water bath, and constant temperature apparatus for research in cellular physiology and pharmacology; a Spencer rotary microtome and additional X-ray equipment.—Two hundred new books and volumes of journals have been added to the library. —A grant for the study of cellular respiration has been made to Dr. D. M. Pace by the American Philosophical Society.—A grant from the National Research Council to Dr. J. E. M. Thompson was made to study local shock following crushing injuries.

Ohio State University, College of Pharmacy.— During the year the graduate program was given formal recognition by the University graduate council. This action places the pharmacy college's graduate activities on the same high standard as that enjoyed by the longer established departments on the campus. The Ph. D. degree may be earned in any of the four major fields of endeavor, namely, pharmacy, pharmacology, pharmacognosy, and pharmaceutical chemistry. Five students are now registered for graduate work.—After a year of the accelerated program, the faculty are on record as considering the program successful in its endeavor to train pharmacists faster. Student morale has remained at a high level, grade levels are equally as good as under the old system, and the student organizations are equally as successful and active as before.

Oregon State College, School of Pharmacy.— Desk tops throughout the laboratories have been refinished and many minor improvements have been made for better instruction.—Emphasis has been placed on course adjustments to meet war time needs.

Philadelphia College of Pharmacy and Science.— Every effort to furnish material and instruction to the winning of the war has been put forth by the faculty, the students and the alumni of this institution. What those efforts have been can only be appreciated by perusing the Bulletins of the College for the academic year.

Purdue University, School of Pharmacy.— A new division of instruction in pharmacology on the undergraduate and graduate levels was established. Dr. Curtis H. Waldon, formerly of the University of Montana, has been appointed in charge of this division of instruction. Equipment including tissue baths, kymographs, operating tables, etc., has been provided to accommodate instruction to approximately twenty-four students in the laboratory at one time. Two rooms in an animal house in the school of agriculture have been made available and completely refinished for our reserve stock and breeding of animals. Although one room has been made available for animals, remodeling of space in the school of pharmacy is in progress to provide more room for animals used in experimentation. The manufacturing laboratory has been expanded by remodeling a room, adding about 350 sq. ft. of floor space, and the addition of a heavy duty, single punch Colton tablet machine, a new granulating and sifting machine, and drying racks. Facilities for research have been improved during the year by the purchase of a large quantity of interchangeable ground glass apparatus, an Adams catalytic reduction apparatus, an electric ignition Parr bomb, a Coleman spectrophotometer, a vacuum pump, an electric furnace, and other equipment.

Ten undergraduate scholarship units in the amount of $162 each were established during the year. Research fellowships in the amount of $9,400 were made available during the year through the Purdue Research Foundation.—The Navy-College Training Program was established at Purdue on July 1. Forty-five students in pharmacy are in Navy uniform. Beginning November 1, it is expected that the civilian and Navy programs will be coordinated.

South Dakota State College, Division of Pharmacy.— The Division of Pharmacy in cooperation with the Agricultural Experiment Station have a project on the growing of hyoscyamus in South Dakota. The results of one year's work are very encouraging.

Medical College of Virginia, School of Pharmacy.— During the past six months the school has been raising funds for students' loans and scholarships. To date we have received six $100.00 scholarships and seven $100.00 loan funds. Each of these grants came from drug concerns, alumni, and other registered pharmacists in Virginia. Several students have been able to enroll because of the aid given them by these funds.

State College of Washington, School of Pharmacy.— This school did not accelerate its program of study during the past year. During the past year about thirty-five students were lost including the usual number of transfers to other departments, loss due to illness and failure. The rest were selectees, Enlisted Reserve Corps members. The freshman class was most heavily affected. Every effort was made to keep the educational program on the high plane of the past, emphasizing modern developments and the effect of the war on the practice of pharmacy. Increased interest in pharmaceutical education on the part

of women is noticeable. The number of girls enrolled last year was 40 and 16 of these were in the freshman class. A larger number is expected to enroll next fall. Also worthy of special note is the interest shown by the Washington State Pharmaceutical Women's Auxiliary in aiding needy students. Five scholarships were awarded during the past year to worthy students with money furnished by the Women's Auxiliary and some of its local branches. The State Auxiliary gave money for two scholarships, the Tacoma chapter also gave for two, and the Spokane chapter gave for one.

University of Washington, College of Pharmacy.— This year has been a turbulent one marked by uncertainties and vexing problems for both students and faculty. The institution, however, has had the able support of the state association, the board of pharmacy and the university administration. The untiring efforts of the officers and the leaders in the national associations has helped to meet and solve many of the problems. The school is operating on an accelerated basis and also offering a normal four year course. Students may enter any quarter and meet the requirements for a degree in twelve quarters or three years. Many of the students, particulaly the women, elect to withdraw from the summer quarter, thus taking four years to complete the work. The University offers two groups of pre medical programs, one in the arts and science and one in the pharmacy college. Many students feel the pharmacy training better prepares them for medical work. The faculty, however, make as their chief objective the training of able students for the profession of pharmacy.—The dean is also state chemist and a well equipped laboratory is maintained for analytical work on foods, feed fertilizers, drugs and oils. Since the war began a considerable amount of work has been done for the various state and federal agencies including an investigation of the fortified wines manufactured in the state and analyses for the state liquor board for the purpose of maintaining standards. The Food Distribution Administration has assigned large quantities of powdered and evaporated milk to the labortory for control tests. Many of these products are used in the Lend-Lease program. Although the laboratory is not a part of the curricular activities of the college, it is nevertheless aiding materially in the war program.

University of Tennessee, School of Pharmacy.— A course in medical technology has been added to be taken in combination with the pharmacy course leading to the bachelor's degree.

West Virginia University, College of Pharmacy.— The program has been accelerated to the extent that a full semester's work is being given during the summer. It is difficult to predict how the new deferment regulations will affect registration in September. Many inquiries are coming in, mostly from young women, concerning the study of pharmacy.

Notes and News

University of Buffalo, College of Pharmacy.—The ninety-seventh annual commencement was held two weeks earlier than usual on account of the accelerated program. Dr. Everett N. Case, president of Colgate University, gave the commencement address. Only five degrees were awarded in pharmacy because the major portion of the senior class was graduated in January.—All members of the pharmacy faculty are teaching Army Air Force Trainees, which precludes vacations even for those who are not teaching pharmacy students during the summer term.

University of Colorado, College of Pharmacy.—Dean Homer C. Washburn retired July 1, from active service in the University. Pending the appointment of a new executive the college of pharmacy will be directed by a committee composed of Dr. R. G. Gustavson, dean of the graduate college and Drs. D. W. O'Day and J. B. Sprowls of the pharmacy staff.—Dr. J. B. Sprowls has been promoted to the rank of assistant professor.—Mr. Henry L. Starburg, formerly medical technologist at the Boulder-Colorado Sanitarium and pharmacist at the Porter and at the Boulder Sanitariums, has been appointed instructor in materia medica. The school calendar has been changed from the qaurter system to three terms of sixteen weeks each in a calendar year. This makes it possible for a student to complete his entire work for the B. Sc. in Pharmacy in 8 terms. Enrollment has taken a severe reduction in numbers due in part to the recent relocation of all students who were enlisted Navy and Marine Reserves.—Dr. Charles F. Poe has recently been promoted to a full Colonel in the Quartermaster Corps of the Army. He is stationed in North Africa.—Dr. Edward Davidson has been commissioned a Major in the Army.—Catherine E. Simon, 1943, who has enlisted in the WAVES, was given a special examination by the Colorado board on June 17-18.

University of Connecticut, College of Pharmacy.—The nineteenth academic year opened June 7, with thirty-five freshmen. Another class of freshmen is expected to enroll in September. The total enrollment is approximately one hundred.—New instructors are Harley S. Thompson in English; Florence Strange in mathematics; and Wayland Williams in first aid.—The class of 1931 prize for general excellence in the freshman year went to Richard Drew and the Alpha Zeta Omega fraternity prize in biology went to Joseph Murphy. Other freshmen receiving honors were Sanford Glassman and Sidney Ross. Juniors receiving scholarship honors were Solomon Balber and Lola Levy, and in the senior class were Aron Anton, Marion Borriello, Russell LeRose and Louis Mattie.—Helen McNulty received the scholarship given by the George H. Kerr Traveling Men's Auxiliary. The Beatrice Fox Auerbach Foundation scholarships have been awarded to Loretta Yokobaskus, Naomi Rudnick, Louis Platcow, and Leonard F. Christiani.—Horace J. Fuller's new text "Latin for Pharmacy Students" is being used in mimeographed form.—Prof. Nicholas W. Fenney spoke at the June meeting of the New Haven Retail Druggists Association on the sub-

ject "Prescription Pricing."—Dean Henry S. Johnson made his annual report on the condition of the college before the State Association, at Hartford, in June.—Over one hundred and sixty former students and three former faculty members are now serving with the armed forces.

Duquesne University, School of Pharmacy.—Dean H. C. Muldoon and Dr. W. R. Lloyd are members of the Poison Gas Defense Service of the Allegheny Council of Defense.—In June Dean Muldoon spoke before the Cambrea-Somerset Counties Pharmaceutical Association at Johnstown on "The Pharmacist in Wartime." He was made an honorary member of the Association.—Drs. Lloyd and Becker are engaged part time in the instruction of the Army Aviation Cadets stationed at Duquesne—Mr. Ralph R. Kreuer has recently been commissioned in the Pennsylvania State Guard.—Dr. Elbert Voss has resigned in order to continue study in pharmacology at the University of Wisconsin.—Approximately 145 students and alumni are now in military service. They range in rank from private to major. Alvin Leibman, a marine, has been reported missing in line of duty and Lt. Sidney L. Miller was decorated in April with a medal by the Air Service for more than 250 hours of observation on anti-submarine patrol.

University of Florida, School of Pharmacy.— R. S. McLean was granted the master's degree in May. The title of his thesis was "A Rapid Staining Technique for Plant and Animal Cells."—Dr. W. J. Husa is teaching mathematics and Drs. L. D. Edwards and C. H. Johnson are carrying courses in physics in the AAF College Training Detachment on the campus.—Dr. Bernard B. Jatul, February 1943, has been elected to Sigma Xi. He now holds a research position with Sharp & Dohme. —The Florida Board of Pharmacy will continue to finance the Bureau of Professional Relations for 1943-1944.

University of Illinois, College of Pharmacy.—Last year we changed from the semester to the quarter plan. Taking three summer quarters will permit graduation in three years.—On March 27 the Enlisted Reserve Corps took one hundred and six of our men. Included were Seymore Lampert and Boyd Granberg, assistants in hospital pharmacy, and Anthony DeRose, assistant in pharmacognosy and pharmacology. —Dr. Roderick Spence, Ignatius Kaski and Robert Martinek of the chemistry department have left the staff and are engaged in a government research project at the University of Chicago.—John Argabrite and Vernon Gee, assistants in pharmacy, are now studying medicine. —Daniel Holland, assistant in chemistry, has resigned.—Joseph Ocenasek and Raymond Adamson, instructors in mathematics and botany, have joined the Ciba Company and Gerston Bruch, assistant in pharmacognosy, has resigned to enter the retail drug field.—Dr. Lester Dolk, instructor in English, who has been absent in Army Service, has returned and Miss Grahame, who carried his work during his absence, has taken a position in Washington, D. C.—James E. Davis has been added to the staff as instructor in mathematics.—During the year four assistants recevied the master's degree. They were Daniel Holland, Ignatius Kaski, Robert Mostruck and Anthony DeRose.—The following students have been elected to the Rho Chi Society: Robert A. Arnold,

Milton Cohn, Gary G. Mann, Lawrence Mirmelli, Milton W. Rosen, Mois J. Sintov, Wilson L. Harland and Joseph A. Koren.—The following officers were selected by the student branch membership of the American Pharmaceutical Association for the coming year: President, Mrs. Mydras Brewer; vice president, James Smith; secretary and treasurer, Mary K. Enright; editor, Dorothy Williams.

Long Island University, Brooklyn College of Pharmacy.— Dr. Arthur Lejwe, who is conducting a research project at the college, represented the Polish Government, in exile, in London, England, at the recent United Nations Conference on Food and Agriculture, in the capacity of an expert on nutritional problems. He served in the section devoted to the study of the consumption levels and requirements of food for all countries of the world with an outlook to adjustments after the war. —Dr. John Ketterle, a practicing physician, who taught pharmacy from 1901-1903, died July 10.

University of Kansas, School of Pharmacy.— A display of Biblical drugs and chemicals was placed in the Round Corner drugstore in Lawrence during Easter Week. The window decorations were in purple and white with palms, two candelabra holding white candles and a picture of "Christ the Apothecary." The exhibit was planned by Drs. Bowers and Weeks.—The prizes won during the year were as follows: The Lehn & Fink medal to Bill B. Bass; the Merck awards to Wayne Dewey and L. Ray Garrett.—P. L. Pruitt, 1943, is an instructor in the summer trimester.—Dr. Roy A. Bowers has been advanced to the rank of Associate Professor of Pharmacy.

Loyola University, College of Pharmacy.— Prof. Louis A. Wilson has been elected treasurer, (the youngest in the history of the association) of the Louisiana State Pharmaceutical Association. He was also elected secretary and treasurer of the sixth district at the Dallas meeting. —There are 47 registrants for the new scholastic year.—Dr. John J. Grasser, Dean emeritus of the college of pharmacy, was awarded the honorary degree of Doctor of Science at the May commencement.

University of Maryland, School of Pharmacy.— Twenty-seven seniors were graduated on May 29, 1943.—Honors were won by the following: gold medal for general excellency, Joseph Sheer; William Simon Memorial prize for proficiency in practical chemistry, Morton Smith; L. S. Williams Practical Pharmacy prize, Sherman Steinberg; Conrad L. Wich Botany & Pharmacognosy prize, Gilbert M. Carouge; Certificates of Honor, Morton Smith, Benjamin Scheinin and Beryle P. Kremer; Merck awards, Beryle P. Kremer and Harold P. Levin.—The graduate school awarded the doctor's degree to Richard M. Barry, John Milton Cross, Walter C. Gakenheimer, Charles I. Jarowski, Robert E. Thompson, and Bernard L. Zenitz, and the master's degree to Ming Chien Chiang.—Dr. Barry is now associated with the Corsan Products Research Laboratory, Flushing, L. I.; Dr. Cross with Merck & Co., at Rahway, N. J., Dr. Gakenheimer at the Minarec Corporation, Baltimore; Dr. Jarowski has a post-doctorate fellowship at the University of Illinois for the second year; Dr. Thompson has a position with the research laboratory of Armour & Co., Chicago; and Dr. Zenitz is contin-

uing study at Northwestern University; Dr. A. Wayne Ruddy, 1940, is now in the chemical research laboratory of the Winthrop Chemical Company; Dr. L. L. Manchey, 1935, is now with the J. T. Baker Chemical Company.

University of Minnesota, College of Pharmacy.—The following awards have been made: Minnesota State Pharmaceutical Association Graduate fellowship to Silas A. Klug; Minnesota State Pharmaceutical Association scholarship to Robert Doerge; Samuel W. Melendy fellowships to William S. Benica and Gertrude M. Horn; Samuel W. Melendy scholarships to Alfred J. Breneman, Hermina J. Gaul, Louis Gulbrandson, Bernard A. Pribyl, and Doris M. Shelley; Lehn & Fink medal to Raymond Hopponen; Wulling Club Key to Celester Lock; Rho Chi sophomore prize to Doris M. Shelley; Kappa Epsilon award to Helen E. Brownlee.—William S. Benica, Robert Doerge, Louis Gulbrandson, Mike Kuzetras and Bernard Pribyl were elected to Rho Chi.—James R. Baumgartner, Robert Doerge, Louis Guldbrandson, Raymond Hopponen, Celester Loch, Mike Muzetras, Bernard Pribyl, Melvin Shink and Joe Shink were elected to Phi Lamda Upsilon.—James H. Boothe, Taito Soine, Willard Hadley and Coy Waller were elected to Sigma Xi.—At the June commencement exercises the Ph. D. degree was conferred upon James H. Boothe and Donald W. Buelow and the M. S. upon Arnold Neva.—The summer quarter has been divided into two terms with each member of the faculty teaching one term only. The students will attend the entire summer.—The sixty-ninth annual meeting and war conference of the Minnesota State Pharmaceutical Association was held at the Nicollet Hotel, Minneapolis, on May 9-10. The faculty was active in presenting committee reports and lectures at the various sections. At the conclusion, Dean Charles H. Rogers and Charles V. Netz were installed, respectively, as president and secretary for the ensuing year.—Dr. Charles O. Wilson has been advanced to associate professor of pharmaceutical chemistry.—Dr. James H. Boothe has accepted a research position with Lederle Laboratories, Inc.—A second graduate fellowship of one thousand dollars annually has been established by Lederle Laboratories, Inc.

Montana State University, School of Pharmacy.—James O. Hoppe received the master's degree at the end of the fall quarter.—During the winter quarter most of the men in pharmacy were lost either to the draft or enlistment. The first and second year classes were practically normal, the loss being in the junior and senior groups. All but one of the June graduates were in the Armed Forces by July 1.—Albert H. Pichioni and Sister Bernadetta Dolores Davenport graduated "cum laude."—Mr. Pichioni was also awarded the Lehn & Fink medal and the Kappa Psi chapter key.—Calvin Hubbard, senior pharmacy student, was appointed Cadet Colonel of the R. O. T. C. and was awarded an officer's saber for military excellence.—Drs. J. F. Suchy and J. C. Kopet are employed as full time instructors in physics this summer in the Air Training Corps.—Dr. Suchy has been elected chairman of the Montana branch of the American Chemical Society.—A sufficient number of students obtained membership in the A. Ph. A. to receive a charter as the twenty-sixth junior organization of the Association.—Dr. Charles E.

Leophart, dean of the law school, has been appointed acting president to succeed Dr. E. O. Melby who has become president of the Greater University composed of the six units of higher education in Montana. —Dean Walter Anderson of the school of education has been appointed vice president.

University of Nebraska, College of Pharmacy.—Before the Nebraska Academy of Science, Dr. Harald Holck gave a paper on "Assays of Convallaria;" Dr. D. M. Pace gave one on "The Effect of Chemical and Physical Factors upon the Growth Substance" and Dr. Paul J. Jannke spoke on two subjects, "Sclerosing Agents—Sodium Morrhuate" and "A Study of the Isomeric Ortho and Para Thymotinic and Carvocrotinic Acids and their Derivatives."—Dr. J. B. Burt has been appointed to the Chancellor's advisory committee for the Chemurgic Project, a project created by an act of the Nebraska Legislature to study the problem of finding new industries for the state.—Eugene M. Sire, a graduate stuent and assistant has been called to the Army. He is a 2d Lieutenant in Field Artillery, stationed at Fort Sill, Oklahoma.—On May 1, 1943, Dean W. A. Jarrett of Creighton University, installed Alpha Epsilon chapter of Rho Chi at the University of Nebraska. Charter members are Helena Redford, Wallis Wimberly, Gilbert R. Christensen, Ella A. Ritz, Eugene T. Kimura, Edward J. Holscher and Benjamin W. McCashland.

Ohio Northern University, College of Pharmacy.—The resignation of Dr. Robert Williams as president became effective June 30. Dr. Robert O. McClure was named his successor on July 1, by the Trustees. —The shortage of pharmacists in northwestern Ohio has become extreme and has resulted in several stores becoming mere vending shops.

Oregon State College, School of Pharmacy.—Dr. Lewis C. Britt, associate professor of pharmacy, has recently been elected president of the Oregon State Chapter of the Society of Sigma Xi for the coming year. —Seniors elected to Phi Kappa Phi were Terrill Cripe and Audrey V. Olson; juniors were Sarah F. Kurtz, Orpha G. Lee and Mack G. Woodward. Audrey V. Olson was also elected to Phi Sigma, and Sarah Kurtz, Orhpa G. Lee, Mack G. Woodward, Dean E. Jackson, Weston K. Hershberger and James D. Keys, Jr. are new members of Rho Chi.—The Lehn and Fink medal went to Richard Alden Flye.—The prizes of the Women's Auxiliary of the Oregon State Pharmaceutical Association went to Marion Frances Walley and Audrey Virginia Olson.—The awards of the North Pacific Branch of the American Pharmaceutical Association went to Theodore Norman Morris.—The Merck awards went to Terrill M. Cripe and Dean E. Jackson.—At the close of the 1942-1943 school year the registration was forty-five per cent women.—The seventy-fifth anniversary of the founding of the Oregon State College was observed at the time of the annual commencement.

Philadelphia College of Pharmacy and Science.—Dr. Leonard Frescoln has been appointed lecturer in first aid technic.—Dr. Maxmillian Ehrenstein has been named lecturer in medical chemistry.—Dr. Julius Sturmer has resigned as dean of science and hereafter the school will function under one dean. Dr. Ivor Griffith will function as both president

and dean and Prof. L. F. Tice as assistant dean.—In the archives of the annual volume of history of the Commonwealth of Pennsylvania is this significant paragraph—"To the Philadelphia College of Pharmacy and Science goes the unique distinction of having been the first college in the United States to receive from the Treasury Department the public award of the Treasury Minute Man Flag."—The freshman class entering June 28 numbers 50.—Joseph T. Gillen, 1937, has been commended for his service as commander of a naval gun crew on a merchant ship enroute to Murmansk, Russia. The commendation to Ensign Gillen said in part,—"The ship was subject to heavy submarine and air attacks and the crew under your command succeeded in bringing down one enemy plane and severely damaging another."—Russell T. Blackwood, 1891, who served the college as an officer of the alumni association and as a trustee for twenty years, died at his home in Philadelphia on June 10.—Dr. Arthur Osol was elected chairman of the Philadelphia section of the American Chemical Society on May 27.—Dean Ivor Griffith was the commencement speaker at the graduating exercises of the School of Nursing of the Philadelphia General Hospital on May 7. The week before he conducted the Welsh Song Festival in New York. On April 29, he gave the Scoville memorial lecture before the Michigan Academy of Pharmacy in Detroit. The Dean has also been named to the general advisory board of the coroner of Philadelphia County and has been selected by the coroner as special consultant in toxicology.—Raymond M. Black, fighter pilot, was killed in action in North Africa, January 15. The decoration of the Purple Heart has been bestowed posthumously.—Over 250 graduates are now in military service.—Lt. Walter H. Haas, 1934, was recently recommended for the Navy's Distinguished Flying Cross. He is credited with having brought down six Japanese planes at Coral Sea and Midway.

University of Pittsburgh, College of Pharmacy.— Dr. Bernard F. Duabert is on leave engaged in biochemical research.

Purdue University, School of Pharmacy.—Approximately 320 persons attended the May meeting of the Purdue Druggist's Business Conference which this year combined with the sixty-second annual convention of the Indiana Pharmaceutical Association.—The school is now giving a course in first aid to the Ensigns of the Navy WTS Flight Instruction School.—Dr. H. George DeKay has been appointed chairman of the first aid detachment of the Red Cross in Tippecanoe County.—Approximately 1250 Navy and Marine men are enrolled at Purdue under the Navy V-12 College Training Program. These men later will become officer candidates in the Navy. Forty-five of the men in the V-12 Program are enrolled in the School of Pharmacy. They were transferred here from the Philadelphia College of Pharmacy and Science, Loyola University of New Orleans, the St. Louis College of Pharmacy, and the universities of Illinois, Michigan, Minnesota, Wisconsin, Iowa and Drake. It is expected that new examinations for the admission of students to this program will be held from time to time and that some of our students will be able to qualify. Men in the program are in uniform with regular base pay and maintenance.—Charles R. Jordan,

'36, son of the late Dean C. B. Jordan, is undergoing training in the Chemical Warfare Service and is now located at Camp Sibert, Alabama.

South Dakota State College, Division of Pharmacy.—Guilford C. Cross resigned as assistant professor of pharmacy effective July 1, and expects to enter the military service.—Eight seniors were graduated at the end of the winter term and ten in June. Most of the men are now in military service.—Mary Jeanne Noonan was graduated "with highest honor" and Mildred Jarratt "with honor." Miss Noonan was awarded a $25.00 war bond for having maintained the highest scholastic average during four years of college work. She has been given a graduate assistantship in pharmacy at Purdue.—The Lehn and Fink medal went to Mrs. Jarratt and the Merck awards to Warner Berg and Leonard Cook.—Norbet Tompkin was awarded the State Board of Pharmacy prize for maintaining the highest scholastic average in the freshman class.—Approximately fourteen hundred soldiers are receiving training in administrative work and engineering on this campus. The Students Health Dispensary maintained by the Division of Pharmacy, puts up all prescriptions and furnishes the medical supplies required by this unit.—Due to enlistment and induction the enrollment has decreased approximately sixty per cent. Even though classes will be small the Division will continue to operate as usual.—The South Dakota State Pharmaceutical Association and the South Dakota State Board of Pharmacy are again each offering a $75.00 scholarship to worthy entering pharmacy students.—The 57th Annual Meeting of the South Dakota Pharmaceutical Association was held on the campus on June 3. It was strictly a war time meeting and only business matters and reports of the officers of the Association were given. —The Division is operating on an accelerated basis. This summer two terms are being offered. There are eighteen students registered, eleven of whom are seniors and will graduate in March 1944. However, all young men graduates enter the armed service soon after graduation so the help situation in the state is becoming acute. The six young women graduates this year had all accepted positions long before graduation. Many more could have been placed.

Medical College of Virginia, School of Pharmacy.—The 1943 freshman class matriculated on July 5. Thirty new students entered at that time. Of these, 24 are freshmen and the remainder have credit for one or more years of college work. There are ten girls in the group, which brings the number of girls to nineteen. This is 30.6 per cent of the entire enrollment. The sophomores, juniors and seniors began their session on April 5. The total enrollment at this time is 62. Sixteen men left school on July 1, to enter the reserve program.—Dr. Clair Spealman, a former instructor in physiology, was recently cited for his work in converting sea water into drinking water by the precipitation methods. (Time Magazine, June 21, 1943, p. 44.) Dr. Spealman, now a Lt. (jg) U. S. N. R., is on military leave. Most of his work on this problem was done in this institution.—Dr. E. L. Smith has been appointed assistant professor in physiology, and Miss Louise Hutzler has been made an assistant in chemistry.

State College of Washington, School of Pharmacy.—Dean Dirstine has been appointed a member of the Advisory Committee for Deferment of Pharmacists and Pharmacy Students in the State of Washington.—Three graduates have recently been promoted to Majors in the Medical Administrative Corps. They are Majors Smith, Zegelow, and La-Fors who rank 1, 3, and 7 respectively, among the officers with pharmacy training in the Corps.—All of the seniors who graduated this past spring have successfully passed the state board of pharmacy examinations. A majority of the graduating men are either in the various armed services or are awaiting call.—Dean Dirstine and Dr. H. Bang were speakers at an Idaho State Pharmaceutical Association meeting at Lewiston.—Dr. A. I. White was a lecturer at the summer school of the British Columbia Pharmaceutical Association in Vancouver, B. C., during the week of June 20th. Dr. White has been recently promoted to the rank of assistant professor.—Dean Dirstine attended the annual meeting of the Washington State Pharmaceutical Association in Seattle, June 20-22. All of the members of the faculty have been placed on an eleven months basis and are now busy with research problems.—Mr. Martin, temporary instructor in pharmacy, has recently completed a research and will receive the M. S. degree this summer.—Dr. H. Bang was elected president of the local chapter of Phi Kappa Phi and secretary of the local branch of the American Association of University Professors for the coming year.—Dr. T. Lowell Swenson, an alumnus, and now director of the Western Regional Federal Research Laboratory at Berkeley, California, spoke to the students and faculty recently on "New Problems in Research."—Dr. H. Fricke, a former graduate student, and now with Abbott Laboratories, visited the school recently.—Dr. James Boothe is now employed by the Lederle Company.—Rho Chi has initiated four undergraduates and Lambda Kappa Sigma has elected three new members.—Miss Marie Reisenauer was awarded the Lehn and Fink medal and Eugene Wagner won the annual McKesson-Robbins scholarship.

University of Washington, College of Pharmacy.—Dr. Heber W. Youngken, Jr., has been granted leave of absence for the duration and has accepted a commission in the Navy.—Dr. James M. Dille has been granted leave to complete the work for the M. D. degree at the University of Illinois.—Dr. Elmer Plein is devoting a part of his time to instructing Navy students in the principles of navigation.—During the year, three men were granted the Ph. D. degree: Dr. John Ellegood whose major was in pharmaceutical chemistry is now with Sharp and Dohme; Dr. Victor Seeberg who majored in pharmacology is with the Cutter Laboratories in Berkeley; Dr. Albert Music formerly an instructor at the Univesity of Tennessee, majored in pharmacognosy.—In September 1942, the number of matriculants was 160. By the end of the spring quarter the figure was less than 100. The entering freshman class was 45 as against 85 in 1941. About 40 per cent of the beginning students were women. There were 27 graduates in June, 9 of whom were women. Many of the men entered some branch of the armed forces. Nine of the recent graduates have or will enter medical schools.

West Virginia University, College of Pharmacy.—Seven students were graduated at the May commencement, two will be graduated at the end of the summer session, and several at the end of the term beginning in the fall.—The Army and Navy have taken practically all of the male students of the freshman and sophomore classes. The enrollment during the year was cut approximately thirty per cent of what it was in September 1942.

Western Reserve University, School of Pharmacy.—Dr. Edward D. Davy has resigned the deanship in order to accept a position with the Winthrop Chemical Company. His present address is 112 Manning Boulevard, Albany, New York. Dr. Franklin J. Bacon has been appointed acting dean to fill the vacancy.—William W. Hosler, 1929 & 1942, vice president in charge of production and the laboratories of Strong, Cobb & Company, has been appointed acting professor of pharmacy on a part time basis.

MARRIAGES

Dr. Theodore T. Dittrich, Loyola University, College of Pharmacy, and Miss Dorothea Brown of Valley Stream, New York, in New Orleans, May 15, 1943.

Dean D. B. R. Johnson, University of Oklahoma, and Mrs. Viola Russel, formerly an instructor in the department of Physiology, in Norman, June 28, 1943.

Prof. Glen H. Brown, University of Mississippi, and Miss Jessie Adcock, Junction City, Ohio, at Friendship Church near Junction City, May 27, 1943.

Lt. William Bowen Church, Jr., and Miss Lois May Newcomb, daughter of Dr. and Mrs. E. L. Newcomb, at Base Chapel, Gieger Field, Spokane, Washington, February 13, 1943.

Edwin Day Lyman, son of Dean and Mrs. R. A. Lyman, and Miss Elvina Short at Lincoln, Nebraska, May 28, 1943.

NEW IN THE FAMILY

Kathryn Elizabeth Austin.—Born July 4, 1943. Daughter of Mr. and Mrs. Hugh Austin, State University of Iowa, College of Pharmacy.

Louis A. Wilson, Jr.—Born September 5, 1942. Son of Prof. and Mrs. Louis A. Wilson, Loyola University, New Orleans.

John Michael Schwarting.—Born April 17, 1943. Son of Mr. and Mrs. Arthur E. Schwarting, Ohio State University.

James Porter Kaufman.—Born May 11, 1943. Son of Dr. and Mrs. K. L. Kaufman, Medical College of Virginia, School of Pharmacy.

Cyril Charles Jannke.—Born June 5, 1943. Son of Dr. and Mrs. Paul J. Jannke, University of Nebraska.

Miscellaneous Items of Interest

A Memorial

J. LEON LASCOFF

1867-1943

When death called Dr. J. Leon Lascoff on Tuesday, May 4th, 1943, there came to a close the most significent pharmaceutical career of this day and generation. I say the most significant, because his life was the embodiment of those virtues, those truths, those precepts which pharmacy as a whole must come to know if it is to survive the crass forces which would block its path. Dr. Lascoff's work will long remain a symbol of hope to all pharmacists who become devoted exponents of the true spirit and purpose of their profession.

Dr. Lascoff's career was significent, too, because it proved that pharmacists can mount to the highest levels of professional achievement. It proved that one can be proud of pharmacy and that no pharmacist is justified in going through life apologizing for his calling. To Dr. Lascoff, pharmacy was its own justification, and all he needed to do was to make himself worthy of a place within its ranks.

His humility was as real as his greatness. He always considered himself indebted to his profession, and never the other way around. It was in his nature to give freely of his talents, with never a thought to personal exaltation. His was the unusual ability to focus attention upon the worth of his profession, rather than upon himself.

His work upon the New York Board of Pharmacy, the Board of Trustees of the College of Pharmacy, Columbia University, the American Pharmaceutical Association, the National Association of Boards of Pharmacy, and in compiling the American Pharmaceutical Asscoiation Recipe Books, was of a high order. Awarding him the Remington Medal was a fitting climax to his brilliant career.

But, while great honors and distinctions were his due, the real Lascoff was to be found in his own prescription laboratory. Here, in his beloved environment, surrounded by the outward manifestations of his profession, his books, his historical collections, he was the incarnation of what every pharmacist has hoped to be. Here he exemplified the finest tenets of pharmaceutical practice. Here he showed that pharmacy can be made a great calling when greatly pursued.

It was my privilege to know Dr. Lascoff intimately over a period of nearly twenty-five years. My affection for him deepened as I came closer and closer to the man.

His widow, and worthy son and successor, have reason to be glad as they mourn. Dr. Lascoff has left a heritage utterly beyond the power of death to change or destroy.

I shall cherish his memory always.

Robert L. Swain.

The American Council on Pharmaceutical Education

*Statement of Further Changes in Policy and Standards Made Necessary by the War Emergency**

The Council's first statement of policy with reference to acceleration of the program of instruction in pharmacy to meet the war emergency, was issued on March 27, 1942, and applied to the course accelerated to the point where it could be completed in three calendar years.

Changes made by the War Manpower Commission and the Selective Service System in the conditions governing the eligibility of pharmacy students for occupational deferment as stated in Activity and Occupation Bulletin No. 33-6, issued March 1, 1943, and amended June 17, 1943, and July 1, 1943, make it necessary for colleges of pharmacy which admit students under this program to accelerate the course of instruction to a total of not more than 24 months.

In the first statement of policy, it was recognized that adjustments in the educational programs of all institutions of higher education might have to be made as a result of the present war emergency, and the belief was expressed that such adjustments in the program of pharmaceutical education as might become necessary could be made wihtout endangering the standards maintained at that time. These are still the views of the Council, although it is recognized that there will have to be some curtailment of the amount of work heretofore given and that the quality of instruction will be lowered somewhat since the time will be too short to permit covering the full curriculum with the usual degree of thoroughness.

The following changes in the standards for accreditation will apply to those colleges of pharmacy which accelerate their programs of in-

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*Enclosed herewith is a statement of the changes made by the American Council on Pharmaceutical Education to enable colleges of pharmacy to operate under the 24-month accelerated program without losing their accreditation. The amendment of July 1, 1943, to Occupation and Activity Bulletin 33-6 of the Selective Service System requires that a student complete the course in 24 months to become eligible for deferment from the draft. The statement also includes the measures which the Council intends to take to exercise control over the colleges operating under the accelerated program.

Please note that there is nothing obligatory about the adoption of the 24-month program of instruction by a college of pharmacy. The decision as to whether it will or will not accelerate its program of instruction to this degree lies entirely with the institution. Some colleges may be able to secure a sufficient number of students from those under 18 years of age, 4-F's, and females to enable them to continue to operate as if conditions were normal. Others may choose to operate under a program of instruction accelerated to three years. All the Council has done is to define the standards which a college of pharmacy will be expected to live up to if it adopts the 24-month program and desires to retain its accreditation.

It will be appreciated if you will give the enclosed statement publicity in your journal.

A. G. DuMez, Secretary.

Baltimore, Md.,
July 29, 1943

struction to 24 months and will remain in force for the duration of the war emergency or until notice of further change is given:

Article V. Teaching Load and Size of Classes.

1. The teaching load shall not exceed *twenty-four hours* per week per teacher and the number in a class (exclusive of lectures) shall not exceed thirty. Not more than two clock hours of laboratory work shall be taken as the equivalent of one clock hour of didactic instruction.

Article VI. Minimum Admission Requirements.

1. A college shall require for admission the satisfactory completion of a four-year course of not less than fifteen units in a secondary school approved by a recognized accrediting agency; or a qualifying certificate for college entrance issued by a state university, or state department of education, or other state department authorized to issue such certificates; *and that the applicant be in the upper three-fifths of his high school class or be recommended by his high school principal as being capable of carrying on satisfactory college work.*

2. Students who are candidates for degrees shall not be admitted to courses leading to such degree later than *one week* after the beginning of a session.

Article VII. Admission to Advanced Standing.

3. Not more than *six months* of credit in time shall be given any student applying for advanced standing from any institution other than a college of pharmacy unless such credit shall be for graduate work in applied subjects done in a recognized graduate school or other accredited educational institution.

Article VIII. Curriculum and Degrees.

1. (a) The pharmacy curriculum shall comprise not less than 3200 clock hours of instruction, of which at least 1300 hours shall consist of laboratory work. Such instruction shall be given within a period of *not more than two calendar years of not less than 48 weeks each*, exclusive of holidays and vacations and shall be scheduled over a minimum of five days per week.

   (b) Deleted.

3. (a) The curriculum *shall include all of the required subjects listed in the fourth edition of the Pharmaceutical Syllabus.*

It is understood that the 24-month program of instruction is a minimum requirement for the Bachelor of Science degree in pharmacy and must be completed by a candidate in full before he is eligible to receive this degree.

The accreditation of a college of pharmacy will be withdrawn if there is any perceptible lowering of educational standards (including

the revised requirements for admission), either in the scope of the curriculum, the total number of hours required for graduation or the level of scholarship demanded.

Measures Adopted to Keep the Council Informed with Respect to the Operation of the Accelerated Programs of Instruction

In order that the Council may have in its files the information which is deemed necessary for the proper control of the accelerated programs of instruction and which may be requested from time to time by the War Manpower Commission, the Selective Service System, and other governmental agencies, the colleges will be sent questionnaires on which they will be expected to supply the following information:

1. Date when program accelerated to 24 months was, or will be, put into operation.
2. Outline of the accelerated two-year curriculum.
3. Schedule of classes.
4. Number of students enrolled by classes and date of expected graduation of each under
   a) the regular four-year program
   b) the program accelerated to three years
   c) the program accelerated to two years
5. Entrance qualifications of all students.
6. Scholastic record of students
   a) Grades of all students at the end of each term (quarter, trimester or semester).
   b) Classification of all students on the basis of scholarship records into those which are deferred and give promise of successfully completing the course and those whose work has been unsatisfactory. Disposition which has been made of the latter.

A. G. DuMez,
Secretary-Treasurer

Pharmacy Corps Bill Enacted by Congress

The Durham-Reynolds Bill to create a Pharmacy Corps in the Regular Army has been enacted by Congress and is now before the President of the United States. Action came quickly in the closing days of Congress before its summer recess. The House passed the Bill unanimously on June 21, the Senate Committee on Military Affairs held a hearing on the legislation June 30th and reported it favorably the following day with certain amendments, the Senate passed the amended bill unanimously on July 3d, and the House concurred in the amendments on July 5th.

The Senate amendments to the Bill were made at the request of the Army and consisted chiefly of creating the Pharmacy Corps as an additional corps within the Medical Department rather than by changing the name of the Medical Administrative Corps to the Pharmacy Corps as provided in the Bill as previously passed by the House. The amended bill provides that present commissioned officers of the Medical Administrative Corps of the Regular Army, which include 16 pharmacists and 42 nonpharmacists, shall be transferred to the Pharmacy Corps, but that their number shall be in addition to the 72 officers of the corps provided by the legislation. This means that under these provisions, the Pharmacy Corps will consist of 88 pharmacists and 42 non-pharmacists until such time as death, retirement, or transfer of the additional 58 men bring the strength of the corps down to the 72 provided in the Bill.

It is expected that President Roosevelt will sign the Pharmacy Corps Bill in view of its unanimous approval by the Senate and House, and since the Senate amendments take care of the Army's principal objection, namely, the fact that the original bill eliminated the Medical Administrative Corps from the Regular Army through the changing of its name to the Pharmacy Corps. Although the Army several years ago had secured the amendment of the National Defense Act reducing the Medical Administrative Corps to 16 officers and permitting only pharmacists to be commissioned in the Corps, the present war has shown that a Medical Administrative Corps is valuable and necessary at least in the Army of the United States.

The enactment of the Pharmacy Corps Bill has been achieved only through the support of all individuals and organizations in the field, and the victory is one in which every pharmacist should feel he has participated. It marks the successful culmination of an effort of more than half a century on the part of the profession of pharmacy to improve the pharmaceutical service in the Army. The profession is indebted to Congressmen Carl T. Durham (N. C.) and Harve Tibbott (Pa.) and Senators Robert R. Reynolds (N. C.) and Chan Gurney (S. D.) for their skillful guidance of the legislation.

Steering Committee of the Committee on a Pharmacy Corps in the Regular Army
Rowland Jones, Jr.
E. F. Kelly
H. Evert Kendig, Chairman

Washington, D. C.
July 6, 1943.

Pharmacy Corps Bill Signed!

The President has signed the Pharmacy Corps Bill and it has therefore become law. This successful conclusion of a long effort on the part of the profession to secure legislation of this type is a great satisfaction to those who have directed the effort. The success of their work

rested upon the interest and support of the pharmaceutical organizations and of the individual pharmacists as well as others who gave their support.

The Committee on Pharmacy Corps in the Regular Army and the members of the Steering Committee wish to express their appreciation to all who have assisted in the enactment of the Pharmacy Corps Bill.

The organization of the Pharmacy Corps will, of course, take some time, and information will be made available with respect to the developments as frequently as possible.

Rowland Jones, Jr.
E. F. Kelly
H. Evert Kendig, Chairman

Washington D. C.
July 13, 1943.

New Books

Arithmetic of Pharmacy by Charles H. Stocking, M.S., and Elmon L. Cataline, Ph.D., Seventh Edition, 1942, D. Van Nostrand Company, Inc., New York, 164 pp., $2.00.

This is the latest edition of the well known Stevens' Arithmetic of Pharmacy, based upon the original text by the late Alviso B. Stevens, formerly Professor of Pharmacy of the University of Michigan. Although the information given by the title page indicates that the book has been revised and enlarged, there are ten fewer pages in the seventh edition than in the sixth, and the total number of problems is reduced slightly. The decrease in the size of the new edition is apparently not due to the deletion of textual material however, but is explained by the deletion of tables, including a saturation table and a series of conversion tables in metrology. The former were rarely used and the latter had greater application to manufacturing pharmacy rather than to the study of pharmaceutical calculations.

Examination of the new edition shows that little new material has been added. The material has been rearranged for the purpose, as stated by the authors, of presenting the material in a logically developing order, the simpler types of calculations preceding the more complicated. In view of this objective, the position assigned to thermometric conversions, which are reserved for consideration as the next to the last general topic, might be questioned, since the inference is that these are to be regarded as among the more difficult types of calculations. A total of 1019 problems are included in the new edition as compared with 1079 in the sixth edition. This abundance of material affords a wide choice of assignments. A list of review problems is appended at the end of each section. Except for the examples used to explain the methods used, the answers to the problems are not given.

In general, it may be said that the methods of calculation are well illustrated and the explanations are clear and concise. The section

on chemical calculations, the longest in the book, is especially comprehensive in scope, and includes the calculations involved in analytical chemistry.

The topics covered are listed in the order in which they occur and are as follows:

Weights and Measures; Specific Gravity; Weight-Volume; Percentage Solutions; Concentration and Dilution; Alligation; Commercial Calculations; Problems Based on the Tables of the Pharmacopœia; Thermometers—Temperature; Chemical Calculations.

J. B. B.

A Manual of Clinical Therapeutics, A Guide for Students and Practitioners,—by Windsor C. Cutting, M.D., Associate Professor of Therapeutics, Stanford University, School of Medicine, San Francisco, California, 1943, 609 pages, W. B. Saunders Company, Price $4.00.

This book is one of the finest books for ready reference concerning the field of therapeutics we have seen. The early chapters deal with the general problems in therapy such as the choice of home or hospital care, general precautions to be taken in case of the sick with specific reference to the problems presented by different organs such as the skin, eye, mouth and nose. It is refreshing to find a medical man calling attention to the wisdom of prescribing U.S.P. preparations rather than proprietaries and why. The significance of general symptoms such as diarrhea, constipation, vomiting, distension, convulsion, delirium and pain are pointed out as well as the use of sedatives, analgesics, stimulants, fluids and dietetic measures. Diseases are classified according to their causative factors where these are definite, otherwise by their anatomic associations. Under each disease or condition general measures of treatment are discussed, followed by specific measures and the methods of prevention. Following the discussion of each subject is given two or three basic literature references which adds to the usefulness of the text. A series of appendices deals with special technic procedures, physiotherapy, symptoms and treatment of poisoning, diets and diet lists, weights and measures and their equivalents, tables and charts for weights, height and age, abbreviations and other aids in prescribing, clinical physiological data, quantitative methods for controlling the therapeutic use of drugs, lists of prescriptions, drugs and doses and a list of works of reference. The text shows the very latest in the therapy of drugs and general measures. Such a book is of the greatest value for the pharmacist and the pharmacy student to keep in touch with the latest trends in therapeutic thought and practice.

R. A. L.

Nature Lore by H. P. K. Agersborg, M. A., M. S., Ph. D., Formerly biologist, U. S. National Park Service, Washington, D. C., Professor of Biology and Head of the Department in the James Millikin University, Decatur, Illinois. Five volumes. 1025 pages. 417 illustrations. C. C. Nelson Publishing Company, Appleton, Wisconsin. Price $10.00, or $2.00 per volume.

These volumes constitute a well illustrated primer in conservation of nature in its widest sense. The author as a teacher and biologist in the government service has directed his energies to make nature serve the needs of man. Volume I discusses the general principles of wildlife conservation and how to apply them in one's state. In Volume II the problem of mutual relationship among organizisms and mimicry are given special consideration. In a chapter "Advice to a College President," the author gives his personal convictions concerning the relation between the doctrine of evolution and the Christian faith. Volume III gives more detailed information concerning the whole problem of trout culture and of rearing salmonid fishes. New Hampshire is singled out for a special discussion of its conservation problems and a suggestion for a law is included. Volume IV discusses land improvement in relation to wildlife. Volume V considers the purpose and scope of a park museum and a summary of some of his own conservation activities in state parks. However, this incomplete list of the topics fails to convey any idea of the personal charm of the author's style in the many independent little chapters and the numerous well chosen illustrations and the interspersed poems in praise of nature and the clear insight one gets into the mode of living of the sturdy inhabitants of Norway, the author's native land. That the author should have adopted the metric system seems but natural in view of his origin and his work with the government, which gradually is doing this, as seen by the adoption of this system exclusively for prescription writing in the armed services. This set of books should bring pleasure and useful information to all members of any household and should be available in every library where biology is being taught.

H. G. O. H.

Drug Store Accounting by J. Brooks Heckert, A. B., A. M., Com. D. Associate Professor of Accounting, Ohio State University and William E. Dickerson, B. B. A., M. B. A., Ph. D., Associate Professor of Accounting, Ohio State University, First Edition, 1943. 415 pages. McGraw Hill Company. Price $4.00.

This volume is unusual in a number of respects. In contrast to the ordinary manual type treatment of the accounting problems of a particular trade, Drug Store Accounting is a complete textbook on accounting. Before introducing illustrative forms with instructions for their use, the authors present a full and detailed explanation of fundamental accounting principles and practices.

Although the main outline follows that of most elementary accounting texts, there are a number of important differences. The accounting requirements of the druggist are kept constantly in the foreground with all examples and illustrations relating to the operations and records of independent drug stores. The discussion of journals is materially simplified by the introduction of multi-columned registers without any preliminaries. All problem material pertains to drug store operations. Chapters on taxes, insurance, budgets, and the use of accounting records for control purposes are included.

The material is divided into three parts. Part I, titled Purpose and Use of Accounting Records, includes an introductory chapter setting forth the various uses of accounting data, two chapters describing in de-

tail the content and form of the two basic accounting statements—the Statement of Financial Condition and the Statement of Income and Expense, and a final chapter in which the analysis and interpretation of the two statements is explained. The statements and the analysis thereof are extensively illustrated. It is also noteworthy that the authors have adopted a classification of expense which is already well known to druggists.

The description and explanation of accounting procedures and records is found in Part II. Following a preliminary chapter on basic objectives and methods, the authors describe the essential features of an accounting system suitable for a medium sized drug store and explain the operation of such a system. The fundamentals of collecting, recording, and summarizing the essential facts concerning the financial condition and operating results of a business concern are covered in seven chapters. The discussion is organized around an example introducing a month's transactions of a typical drug store. The journal entries, accounts, and statements, as they would appear when all the accounting work for the month has been completed, are all fully illustrated.

The remaining six chapters of Part II introduce some of the refinements which might prove desirable or necessary. Departmental records, labor saving equipment and methods, prepaid and accrued items, partnership accounts and corporation records are covered in this section of the text.

Control of Operations is the title of Part III. Here the authors present a very practical discussion of the control aspects of drug store management. Special attention is given to the use of accounting reports and records in connection with control. The following chapter titles are indicative of the scope of the material included in this part: Cash Control, Merchandise Control, Equipment Control, Sales and Gross Profit Control, Expense and Financial Control, Taxes and Insurance, and Budgeting. Chapter 26 sets forth the procedure for installing an accounting system.

The text is particularly well adapted for use in schools and colleges of pharmacy. No previous knowledge of either accounting or drug store operations is assumed. The generally accepted methods of instruction in accounting have been combined with examples, illustrations, and forms which apply to drug store operations. Students of pharmacy who expect to enter the retail drug field will recognize the value of the work immediately.

Twenty-one pages of carefully prepared problem material is included. Each problem is designed to accompany a certain chapter and assignments are suggested. All problems relate to drug store operations.

The numerous illustrations which are included and the emphasis on the practical problems of the pharmacist make the material suitable for home study and valuable as a source of reference. The eight chapters on control of drug store operations should be of interest to anyone engaged in drug store management regardless of interest in or knowledge of accounting.

E. L. N.

INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

New Jersey

Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark. Ernest Little, Dean (1925)

New York

University of Buffalo, School of Pharmacy, Buffalo. A. B. Lemon, Dean (1888)

Columbia University, College of Pharmacy of the City of New York, New York. Charles W. Ballard, Dean (1904)

Fordham University, College of Pharmacy, New York. Charles J. Dengler, Acting Dean (1939)

Long Island University, Brooklyn College of Pharmacy, Brooklyn. Hugo H. Schaefer, Dean (1929)

North Carolina

University of North Carolina, School of Pharmacy, Chapel Hill. J. Grover Beard, Dean (1917)

North Dakota

North Dakota Agricultural College, School of Pharmacy, Fargo. William P. Sudro, Dean (1932)

Ohio

Ohio Northern University, College of Pharmacy, Ada. Rudolph H. Rauch, Dean (1925)

Ohio State University, College of Pharmacy, Columbus. Bernard V. Christensen, Dean (1906)

University of Toledo, College of Pharmacy, Toledo. George L. Baker, Dean (1941)

Western Reserve University, School of Pharmacy, Cleveland. Franklin J. Bacon, Acting Dean (1902)

Oklahoma

University of Oklahoma, School of Pharmacy, Norman. David E. M. Johnson, Dean (1908)

Oregon

Oregon State College, School of Pharmacy, Corvallis. Adolph Ziefle, Dean (1915)

Pennsylvania

Duquesne University, School of Pharmacy, Pittsburgh. Hugh C. Muldoon, Dean (1927)

Philadelphia College of Pharmacy and Science, Philadelphia. Ivor Griffith, Dean (1900)

Temple University, School of Pharmacy, Philadelphia. H. Evert Kendig, Dean (1852)

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh. C. Leonard O'Connell, Dean (1900)

Philippines

University of the Philippines, College of Pharmacy, Manila. Mariano V. del Rosario, Dean (1917)

Puerto Rico

University of Puerto Rico, College of Pharmacy, Rio Piedras. Luis Torres-Diaz, Dean (1926)

Rhode Island

Rhode Island College of Pharmacy and Allied Sciences, Providence. W. Henry Rivard, Dean (1920)

South Carolina

Medical College of the State of South Carolina, Charleston. Robert Wilson, Jr., Dean, School of Pharmacy, William F. Prout, Acting Director (1940)

University of South Carolina, School of Pharmacy, Columbia. Emery E. Motley, Dean (1928)

South Dakota

South Dakota State College, Division of Pharmacy, Brookings. Floyd J. La Blaise, Dean (1908)

Tennessee

University of Tennessee, School of Pharmacy, Memphis. Robert L. Ward, Dean (1914)

Texas

University of Texas, College of Pharmacy, Austin. William F. Gidley, Dean (1926)

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Medical College of Virginia, School of Pharmacy, Richmond. Wortley F. Rudd, Dean (1908)

Washington

State College of Washington, School of Pharmacy, Pullman. Pearl H. Dobbins, Dean (1913)

University of Washington, College of Pharmacy, Seattle. Forest J. Goodrich, Dean (1908)

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West Virginia University, College of Pharmacy, Morgantown. J. Lester Hayman, Director (1920)

Wisconsin

University of Wisconsin, School of Pharmacy, Madison. Arthur H. Uhl, Director (1909)